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ICESat (GLAS) Science Processing Software Document Series

The GLAS Standard Data Products Specification—Data Dictionary, Version 1.0

Jeffrey E. Lee

National Aeronautics and
Space Administration

Goddard Space Flight Center
Greenbelt, Maryland 20771

January 2013

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Jeffrey E. Lee
Stinger Ghaffarian Technologies, Inc., Wallops Island, VA

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Space Administration

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Foreword

The GEOSCIENCE LASER ALTIMETER SYSTEM (GLAS) is the primary instrument for the ICESat (Ice, Cloud and Land Elevation Satellite) laser altimetry mission. ICESat is the benchmark Earth Observing System (EOS) mission for measuring ice sheet mass balance, cloud and aerosol heights, as well as land topography and vegetation characteristics. From 2003 to 2009, the ICESat mission provided multi-year elevation data needed to determine ice sheet mass balance as well as cloud property information, especially for stratospheric clouds common over polar areas. It also provided topography and vegetation data around the globe, in addition to the polar-specific coverage over the Greenland and Antarctic ice sheets.

This document contains the data dictionary for the GLAS standard data products. This Standard Data Products Specification is developed under the structure of the NASA STD-2100-91, a NASA standard defining a four-volume set of documents to cover an entire software life cycle. Under this standard a section of any volume may, if necessary, be rolled out to its own separate document. This document is a roll out of the GLAS ESDIS Software Detailed Design Specification under the Product Specification Volume.

This document details the parameters present on GLAS standard data products. The term "standard data products" refers to those EOS instrument data products listed in the Earth Science Data and Information System (ESDIS) Project data base that are routinely generated within the EOSDIS Distributed Active Archive Center (DAAC) or Science Computing Facilities (SCFs). Each data product has a unique Product Identification code assigned by the Senior Project Scientist.

This document was prepared under auspices of the Cryospheric Sciences Laboratory at NASA Goddard Space Flight Center, in support of B. E. Schutz, GLAS Science Team Leader for the GLAS Investigation. This work was performed under the direction of David W. Hancock, III, who may be contacted at (757) 824-1238, David.W.Hancock@nasa.gov (e-mail), or (757) 824-1036 (FAX).

This document was created through the efforts of the GLAS Science Algorithm Software (GSAS) Development Team. Current team members include:

SGT, Inc./Kristine Barbieri

SGT, Inc./Suneel Bhardwaj

SGT, Inc./Annette Conger

SGT, Inc./John DiMarzio

Sigma/David W. Hancock, III

SGT, Inc./Peggy Jester

SGT, Inc./Jeffrey Lee

SGT, Inc./Lisa Lee

SGT, Inc./Steve McLaughlin

SSAI/Steve Palm

SGT, Inc./Carol Purdy

SGT, Inc./Lee Anne Roberts

SGT, Inc./Jack Saba

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Section 1

Introduction

1.1 Identification of Document

This document is identified as the GLAS Standard Data Products Specification - Data Dictionary (SDPS-DD). The unique document identification number within the GLAS Standard Data Software documentation numbering scheme is designated on the cover page. This edition marks the first and final release of this document. Information contained within this document was formerly contained in appendices of the GLAS Standard Data Products Specification Level 1 (SDPS-L1) and Level 2 (SDPS-L2) documents.

1.2 Scope of Document

This document describes parameters contained with the GLAS Standard Data Products. The intended audience for this document is the GLAS Science and Instrument Teams, the ESDIS Project and related focus teams, the community of data users and investigators, and the GSAS Development Team.

1.3 Purpose and Objectives of Document

The purpose of the GLAS Standard Data Products Specification - Data Dictionary is to provide a detailed description of the parameters contained with the GLAS Standard Data Products.

1.4 Document Organization

This document's outline is assembled in a form similar to those presented in the NASA Software Engineering Program [Information Document 2.3a].

1.5 Document Status and Schedule

This document is the first and final version of the GLAS Standard Data Products Specification - Data Dictionary.

1.5.1 Document Change History

Document Name: GLAS Standard Data Products Data Dictionary		
Version Number	**Date**	**Nature of Change**
Version 1.0	August 2012	Original Version. Final Release.

Section 2

Related Documentation

2.1 Parent Documents

The GLAS Level 1 Standard Data Products Specification - Data Dictionary is considered a "roll-out" from the Product Specification as the parent document or volume. Specific topics pertaining to data descriptions are located in the External Interface section under the Detailed Design document template.

This document is subordinate to any top-level mission or instrument management plan documents, and as such, recognizes these documents as external parent documents in lineage. The recognized external EOSDIS and GLAS parent documents superior to this document are listed below.

a) *NASA Earth Observing System Geoscience Laser Altimeter System GLAS Science Requirements Document,* Version 2.01, October 1997, Center for Space Research, University of Texas at Austin.

b) *GLAS Science Software Management Plan,* NASA/TM-1999-208641/Version 3/Volume 1, August 1998, NASA/GSFC Wallops Flight Facility.

2.2 Applicable Documents

The following documents are related to, or contain policies or references pertinent to the contents of this document.

a) *The Algorithm Theoretical Basis Document for Level 1A Processing*, NASA/TM-2012-208641 / Volume 5, June 2012, NASA Goddard Space Flight Center, et al.

b) *The Algorithm Theoretical Basis Document for the GLAS Atmospheric Data Products*, NASA/TM-2012-208641 / Volume 6, July 2012, NASA Goddard Space Flight Center, et al.

c) *The Algorithm Theoretical Basis Document for the Derivation of Range and Range Distributions from Laser Pulse Waveform Analysis for Surface Elevations, Roughness, Slope, and Vegetation Heights*, NASA/TM-2012-208641/Volume 7, August 2012, NASA Goddard Space Flight Center, et al.

d) *The Algorithm Theoretical Basis Document for the Atmospheric Delay Correction to GLAS Laser Altimeter Ranges*, NASA/TM-2012-208641/Volume 8, NASA Goddard Space Flight Center, et al.

e) *The Algorithm Theoretical Basis Document for Tidal Corrections*, NASA/TM-2012-208641/Volume 9, Scripps Institution for Oceanography, et al.

f) *The Algorithm Theoretical Basis Document for Precision Orbit Determination*, 2012, University of Texas Center for Space Research, et al.

g) *The Algorithm Theoretical Basis Document for Precision Attitude Determination*, 2012, University of Texas Center for Space Research, et al.

h) *The Algorithm Theoretical Basis Document for Laser Footprint Location (Geolocation) and Surface Profiles*, 2012, University of Texas Center for Space Research, et al.

i) *GLAS Standard Data Products Specification - Level 1*, NASA/TM-2013-208641/Volume 13, NASA Goddard Space Flight Center, et al.

j) *GLAS Standard Data Products Specification - Level 2*, NASA/TM-2013-208641/Volume 14, NASA Goddard Space Flight Center, et al.

k) *GSAS Detailed Design Document*, NASA/TM-2013-208641/Volume 16, NASA Goddard Space Flight Center, et al.

l) *GSAS User's Guide*, NASA/TM-2013-208641/Volume 17, NASA Goddard Space Flight Center, et al.

2.3 Information Documents

The following documents are provided as sources of information that provide background or supplemental information that may clarify or amplify material in this document.

a) *NASA Software Documentation Standard Software Engineering Program*, NASA-STD-21000-91, July 29, 1991, NASA.

b) *The Geoscience Laser Altimetry/Ranging System*, IEEE Transactions on Geoscience and Remote Sensing, Vol. GE-25, No. 5, September 1987.

c) *EOS Altimetry/GLAS Phase-A Study*, November 1995, NASA Goddard Space Flight Center.

d) *Memorandum: GLAS Data Products, Center for Space Research*, December 23, 1993, University of Texas at Austin.

e) *GLAS Science Computing Facility (SCF) Plan,* October 1997, NASA/GSFC Wallops Flight Facility.

Section 3

Standard Label Contents & Description

GLAS Products begin with ASCII header records containing information regarding the processing which created the product and the data contained within. These header records are exactly the same size as a product data record and contain ASCII information in a slightly modified KEYWORD=VALUE format. In order to conserve space on the product, the header records contain multiple KEYWORD=VALUE entries and entries are delimited by a semicolon (;) and linefeed (ASCII 10).

By design, the first two header entries are the record length and number of header records. This allows product reader code to verify the record length and jump directly to the first data record, if necessary. Most of the remaining information within the headers is directly applicable to the generation of metadata files for EOS ingest.

The following fields are defined for GLAS Product Headers:

Table 3-1 Product Header Elements

Keyword	Content Description
Additional_Attribute	Product-specific additional attributes.
AutomaticQualityFlagExplan	Automatic Quality flag explanation (per parameter).
Cycle	A count of the number of exact repeats of this reference orbit.
EquatorCrossingDate	Date of the equator crossing.
EquatorCrossingLong	Longitude of equator crossing.
EquatorCrossingTime	Time of the equator crossing.
glas_osc_rate	Value that indicates the accuracy rate of the GLAS oscillator.
glas_osc_rate_date	Valid date of the GLAS oscillator rate. (yyyy-mm-dd)
glas_osc_rate_time	Valid time of the GLAS oscillator rate. (hh:mm:ss)
InputPointer	Name of each input product file used to created this product (one instances of this keyword appears in the product header record for each input product file used in creation of this product).
internal_range_delay	Internal range delay for digitizer in meters (from anc33).
internal_range_delay_date	Valid date of corresponding internal range delay. (yyyy-mm-dd)
internal_range_delay_time	Valid time of corresponding internal range delay. (hh:mm:ss)
internal_time_delay	Time delay for digitizer in seconds (from anc33).
internal_time_delay_date	Valid date of internal time delay. (yyyy-mm-dd)
internal_time_delay_time	Valid time of internal time delay. (hh:mm:ss)
Instance	The number of times that a specific reference orbit has been returned to during flight.

Table 3-1 Product Header Elements (Continued)

Keyword	Content Description
instrument_short_name	Short name of instrument (GLAS).
Instrument_State	Flag word that indicates which redundant units (laser, detector, oscillator) of the GLAS instrument are in operation.
Instrument_State_Date	The date that corresponds to the Instrument_State. There are a maximum of two per granule.
Instrument_State_Time	The time that corresponds to the Instrument_State. There are a maximum of two per granule.
LocalGranuleID	Filename of the granule.
LocalVersionID	Granule version number (auto-incrementing, nn in filenaming convention).
Numhead	Number of header records preceeding product data records.
OperationalQualityFlagExpl	Operational Quality flag explanation (per parameter).
Orbit Number	Orbit number
OrbitQuality	Status word that states what type of orbit was used during processing of the data for the granule. It specifies the models used in the orbit determination program. This provides an indication of the quality of the orbits being applied to the data.
ParameterName	Name of product specific parameters for which additional information follows.
PercentFullRate	Percent of data for this granule that atmospheric parameters are provided at 40 Hz data rate.
PercentGroundHit	Percent of data for this granule that had a detected ground return of the transmitted laser pulse.
PercentHighRate	Percent of data for this granule that atmospheric parameters are provided at 5 Hz data rate.
PercentLowRate	Percent of data for this granule that atmospheric parameters are provided at 0.25 Hz data rate.
PercentMediumRate	Percent of data for this granule that atmospheric parameters are provided at 1 Hz data rate.
Percent1064to532	Percent atmospheric profiles that use the 1064 nm profile data to provide estimated values for the saturated 532nm profiles.
PGEVersion	Version number of the GSAS software that generated this granule.
platform_short_name	Short name of spacecraft (Icesat).
ProductionDateTime	Creation time of granule.
QAPercentMissingData	Percent of missing data (per parameter)
QAPercentOutofBounds	Percent of out-of-bounds data (per parameter)
RangeBeginningDate	Start date of data on the granule.

Table 3-1 Product Header Elements (Continued)

Keyword	Content Description
RangeEndingDate	End data of data on the granule.
RangeBeginningTime	Start time of day for data on this granule.
Range_Bias	The additive calibration correction in millimeters to apply to range based on the science team cal/val activities.
Range_Bias_Date	The date that corresponds to the first valid Range_Bias. There are a maximum of two per granule.
Range_Bias_Time	The time that corresponds to the first valid Range_Bias. There are a maximum of two per granule.
RangeEndingTime	End time of day for data on this granule.
Recl	Record length in bytes.
ReferenceOrbit	Assigned number for which exact orbital elements describe the exact repeat orbit pattern.
ReprocessingPlanned	Planned reprocessing status.
ReprocessingActual	Actual reprocessing status.
sc_osc_rate	Value that indicates the accuracy of the spacecraft oscillator.
sc_osc_rate_date	Valid date of the spacecraft oscillator measurement. (yyyy-mm-dd)
sc_osc_rate_time	Valid time of the spacecraft oscillator measurement. (hh:mm:ss)
sensor_short_name	Short name of sensor (LaserALT).
ScienceQualityFlagExplana	Science Quality flag explanation (per parameter).
ShortName	GSAS Filetype.
size_mb_ecs_data_granule	Size (in MB) of the granule.
SP_ICE_GLAS_EndBlock	Integer SPICE block number within GLAS coverage scheme in which granule data ends.
SP_ICE_PATH_NO	Number which represents the GLAS SPICE path number.
SP_ICE_GLAS_StartBlock	Integer SPICE block number within GLAS coverage scheme in which granule data starts.
time_between_contiguous_records	Time between contiguous data records (in seconds).
Timing_Bias	The time tag error determined by the calibration team that was added to the time tags to compute the true time of data as provided on the granule.
Timing_Bias_Date	The date that corresponds to the Timing_Bias. There are a maximum of two per granule.
Timing_Bias_Time	The time of day that corresponds to the Timing_Bias. There are a maximum of two per granule.
Timing_Drift	This is the ratio of the true time for a one second oscillator tick to nominal one.

Table 3-1 Product Header Elements (Continued)

Keyword	Content Description
Timing_Drift_Date	The date that corresponds to the Timing_Drift. There are a maximum of two per granule.
Timing_Drift_Time	The time of day that corresponds to the Timing_Drift. There are a maximum of two per granule.
Track	The unique number assigned for each repeat ground track (one orbit) of the reference orbit.
Track_Segment	Number assigned for the specific latitude segment (1 = +50 to +50, 2 = +50 to -50, 3 = -50 to -50, 4 = -50 to +50) of the track for the data.
VersionID	The ESDT version number that is to be used with this product.
Additional product specific information	(see Table 3-2)

In addition to the common information contained in its headers, each product may also contain information specific to the type of data it contains. This type of information is called a product-specific attribute (PSA). The PSAs mostly contain information related to product data quality. The PSAs and their attributes are listed in Table 3-2.

Table 3-2 Product Specific Elements

Product	Parameter Name	Attribute Name	Attribute
GLA01	Range	AutomaticQualityFlag	Flag will fail if percent no range > N% or percent missing > M% or percent out of bounds > B% where N, M, B are TBD.
		QAPercentMissingData	Percent Missing is the number of either (APID 12+13) or (APID 19).
		QAPercentOutofBounds	Percent Out of Bounds is percent of time EchoPeakLoc = 0 for shots w/ APID 19 AND (12 or 13) present.
GLA02	PC_Profile	AutomaticQualityFlag	Flag will fail if PCProfile_PctMissing > 5%.
		QAPercentMissingData	Percent Missing is percent missing either (APID 15) or(APID 19).
GLA02	CD_Profile	AutomaticQualityFlag	Flag will fail if CDProfile_PctMissing > 5%.
		QAPercentMissingData	Percent Missing is missing either (APID 17) or (APID 19).

Table 3-2 Product Specific Elements (Continued)

Product	Parameter Name	Attribute Name	Attribute
GLA03	Data	AutomaticQualityFlag	Flag will fail if Data_PctMissing > 5%.
		QAPercentMissingData	Percent Missing is percent missing 16 second frames using requested granule times.
GLA03	Temperature	AutomaticQualityFlag	Flag will fail if any temperature is out of bounds.
		QAPercentOutofBounds	Percent Out of Bounds is % of temperature parameters that are out of bounds. Use Red LImits.
GLA03	Voltage	AutomaticQualityFlag	Flag will fail if any voltage is out of bounds.
		QAPercentOutofBounds	Percent Out of Bounds is percent of voltage parameters that are out of bounds. Use Red LImits.
GLA04	prap	AutomaticQualityFlag	Flag will fail if PRAP_PctMissing > 5%.
		QAPercentMissingData	Percent Missing is % missing APID 1984.
GLA04	Gyro	AutomaticQualityFlag	Flag will fail if Gyro_PctMissing > 5%.
		QAPercentMissingData	Percent Missing is % missing in appropriate APID.
GLA04	Laser Reference System	AutomaticQualityFlag	Flag will fail if LRS_PctMissing > 5%.
		QAPercentMissingData	Percent Missing is % missing in appropriate APID.
GLA04	Star Tracker	AutomaticQualityFlag	Flag will fail if BST_PctMissing > 5%.
		QAPercentMissingData	Percent Missing is % missing in appropriate APID.
GLA04	Laser Pulse Array	AutomaticQualityFlag	Flag will fail if LPA_PctMissing > 5%.
		QAPercentMissingData	Percent Missing is % missing APID 26.

Table 3-2 Product Specific Elements (Continued)

Product	Parameter Name	Attribute Name	Attribute
GLA04	Instrument Star Tracker	AutomaticQualityFlag	Flag will fail if IST_PctMissing > 5%.
		QAPercentMissingData	Percent Missing is % missing in appropriate APID.
GLA05	Range	AutomaticQualityFlag	Flag will fail if % no range > 25% or percent missing > 5% or percent out of bounds > 15%. Percent no range = percent missing + percent out of bounds - percent out of bounds * percent missing / 100.
		QAPercentMissingData	Percent Missing is (Expected - Received) / Expected. Expected from start/stop times on INPUT_FILE line.
		QAPercentOutofBounds	Percent Out of Bounds is percent of received with entire signal below threshold.
GLA06	Surface Elevation	AutomaticQualityFlag	Flag will fail if percent no elevation > 25% or percent missing > 5% or percent out of bounds > 15%. Percent no elevation = percent missing + percent out of bounds - percent out of bounds * percent missing / 100.
		QAPercentMissingData	Percent Missing is (Expected - Received) / Expected.
		QAPercentOutofBounds	Percent Out of Bounds is number of invalid / number of shots received.
GLA06	Surface Roughness	AutomaticQualityFlag	Flag will fail if SurfRoughness_PctOOB > 5%.
		QAPercentOutofBounds	Percent Out of Bounds is number of Invalid / number of shots received.

Table 3-2 Product Specific Elements (Continued)

Product	Parameter Name	Attribute Name	Attribute
GLA06	Surface Reflectance	AutomaticQualityFlag	Flag will fail if SurfReflectance_PctOOB > 5%.
		QAPercentOutofBounds	Percent Out of Bounds is number of invalid / number of shots received.
GLA06	Surface Slope	AutomaticQualityFlag	Flag will fail if SurfSlope_PctOOB > 5%.
		QAPercentOutofBounds	Percent Out of Bounds is number of invalid / number of shots received.
GLA07	532nm Attenuated Back-scatter	AutomaticQualityFlag	Flag, will fail if the parameter percent out of bounds is greater than 5%.
		QAPercentOutofBounds	Percent Out if Bounds is the number of invalid divided by number of shots received.
GLA07	1064nm Attenuated Back-scatter	AutomaticQualityFlag	Flag, will fail if the parameter percent out of bounds is greater than 5%.
		QAPercentOutofBounds	Percent Out if Bounds is the number of invalid divided by number of shots received.
GLA08	Aerosol Layer Heights	AutomaticQualityFlag	Flag, will fail if the parameter percent out of bounds is greater than 5%.
		QAPercentOutofBounds	Percent Out if Bounds is the number of invalid divided by number of shots received.
GLA08	Planetary Boundary Layer	AutomaticQualityFlag	Flag, will fail if the parameter percent out of bounds is greater than 5%.
		QAPercentOutofBounds	Percent Out if Bounds is the number of invalid divided by number of shots received.

Table 3-2 Product Specific Elements (Continued)

Product	Parameter Name	Attribute Name	Attribute
GLA09	Cloud Layer Heights	AutomaticQualityFlag	Flag, will fail if the parameter percent out of bounds is greater than 5%.
		QAPercentOutofBounds	Percent Out if Bounds is the number of invalid divided by number of shots received.
GLA10	Cloud Backscatter Cross Section Profile	AutomaticQualityFlag	Flag, will fail if the parameter percent out of bounds is greater than 5%.
		QAPercentOutofBounds	Percent Out if Bounds is the number of invalid divided by number of shots received.
GLA10	Cloud Extinction Cross Section Profile	AutomaticQualityFlag	Flag, will fail if the parameter percent out of bounds is greater than 5%.
		QAPercentOutofBounds	Percent Out if Bounds is the number of invalid divided by number of shots received.
GLA10	Aerosol Backscatter Cross Section Profile	AutomaticQualityFlag	Flag, will fail if the parameter percent out of bounds is greater than 5%.
		QAPercentOutofBounds	Percent Out if Bounds is the number of invalid divided by number of shots received.
GLA10	Aerosol Extinction Cross Section Profile	AutomaticQualityFlag	Flag, will fail if the parameter percent out of bounds is greater than 5%.
		QAPercentOutofBounds	Percent Out if Bounds is the number of invalid divided by number of shots received.
GLA11	Cloud Optical Depth	AutomaticQualityFlag	Flag, will fail if the parameter percent out of bounds is greater than 5%.
		QAPercentOutofBounds	Percent Out if Bounds is the number of invalid divided by number of shots received.

Table 3-2 Product Specific Elements (Continued)

Product	Parameter Name	Attribute Name	Attribute
GLA11	Aerosol Optical Depth	AutomaticQualityFlag	Flag, will fail if the parameter percent out of bounds is greater than 5%.
		QAPercentOutofBounds	Percent Out if Bounds is the number of invalid divided by number of shots received.
GLA11	Planetary Boundary Layer Optical Depth	AutomaticQualityFlag	Flag, will fail if the parameter percent out of bounds is greater than 5%.
		QAPercentOutofBounds	Percent Out if Bounds is the number of invalid divided by number of shots received.
GLA12	Surface Elevation	AutomaticQualityFlag	Flag, will fail if surface elevation percent out of bounds is greater than 5%.
		QAPercentOutofBounds	Percent Out of Bounds is the number of invalid divided by number of shots received.
GLA12	Surface Roughness	AutomaticQualityFlag	Flag, will fail if surface roughness percent out of bounds is greater than 5%.
		QAPercentOutofBounds	Percent Out of Bounds is the number of invalid divided by number of shots received.
GLA12	Surface Reflectance	AutomaticQualityFlag	Flag, will fail if surface reflectance percent out of bounds is greater than 5%.
		QAPercentOutofBounds	Percent Out if Bounds is the number of invalid divided by number of shots received.
GLA12	Surface Slope	AutomaticQualityFlag	Flag, will fail of surface slope percent out of bounds is greater than 5%.
		QAPercentOutofBounds	Percent Out of Bounds is the number of invalid divided by number of shots received.

Table 3-2 Product Specific Elements (Continued)

Product	Parameter Name	Attribute Name	Attribute
GLA13	Surface Elevation	AutomaticQualityFlag	Flag, will fail if surface elevation percent out of bounds is greater than 5%.
		QAPercentOutofBounds	Percent Out of Bounds is the number of invalid divided by number of shots received.
GLA13	Surface Roughness	AutomaticQualityFlag	Flag, will fail if surface roughness percent out of bounds is greater than 5%.
		QAPercentOutofBounds	Percent Out of Bounds is the number of invalid divided by number of shots received.
GLA13	Surface Reflectance	AutomaticQualityFlag	Flag, will fail if surface reflectance percent out of bounds is greater than 5%.
		QAPercentOutofBounds	Percent Out of Bounds is the number of invalid divided by number of shots received.
GLA14	Surface Elevation	AutomaticQualityFlag	Flag, will fail if surface elevation percent out of bounds is greater than 5%.
		QAPercentOutofBounds	Percent Out of Bounds is the number of invalid divided by number of shots received.
GLA14	Surface Roughness	AutomaticQualityFlag	Flag, will fail if surface roughness percent out of bounds is greater than 5%.
		QAPercentOutofBounds	Percent Out of Bounds is the number of invalid divided by number of shots received.
GLA14	Surface Reflectance	AutomaticQualityFlag	Flag, will fail if surface reflectance percent out of bounds is greater than 5%.
		QAPercentOutofBounds	Percent Out of Bounds is the number of invalid divided by number of shots received.

Table 3-2 Product Specific Elements (Continued)

Product	Parameter Name	Attribute Name	Attribute
GLA14	Surface Slope	AutomaticQualityFlag	Flag, will fail of surface slope percent out of bounds is greater than 5%.
		QAPercentOutofBounds	Percent Out of Bounds is the number of invalid divided by number of shots received.
GLA15	Surface Elevation	AutomaticQualityFlag	Flag, will fail if surface elevation percent out of bounds is greater than 5%.
		QAPercentOutofBounds	Percent Out of Bounds is the number of invalid divided by number of shots received.
GLA15	Surface Roughness	AutomaticQualityFlag	Flag, will fail if surface roughness percent out of bounds is greater than 5%.
		QAPercentOutofBounds	Percent Out of Bounds is the number of invalid divided by number of shots received.
GLA15	Surface Reflectance	AutomaticQualityFlag	Flag, will fail if surface reflectance percent out of bounds is greater than 5%.
		QAPercentOutofBounds	Percent Out of Bounds is the number of invalid divided by number of shots received.

Section 4

Data Dictionary

4.1 Description of the Data Dictionary

Detailed parameter descriptions are provided in this section. These descriptions provide details for each parameter within a product file. Table 4-1 lists the fields shown in each detailed data dictionary description.

Table 4-1 GLAS Data Dictionary

Field	Description
Product Var Name	Unique identifying name of the product variable.
Is element of:	Corresponding record where variable is located.
Short Description	Descriptive name of the product variable.
Prod Data Type	Product (Unscaled) Variable Type and dimensions (in parens). **i1b** = Integer, 1 byte **i2b** = Integer, 2 bytes **i4b** = Integer, 4 bytes **r4b** = Real, 4 bytes **r8b** = Real, 8 bytes etc...
Total Bytes	Total number of bytes used by variable.
Product Units	Units in which variable is stored on product file.
Total Bytes	Total number of bytes used by variable.
Product Units	Units in which variable is stored on product file.
Invalid Value/Flag	Indicates what identifies the filed as being invalid. **None** = variable cannot be invalid. **gd_invalid_*xxx*** = datatype-specific value which indicates the variable is not valid. ***[variable name]*** = name of the flag to check in order to determine validity of the variable.
Is Correction Flag	Flag indicating if the variable is a correction flag.
Is Unsigned?	Flag indicating if variable should be treated as unsigned.
Product Minimum	Minimum value supported in product variable.
Product Maximum	Maximum value supported in product variable.
Description	Text description.
Comments	Text comments.

4.2 Data Dictionary

Product Var Name i_rec_ndx

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: GLAS Record Index

Product Data Type: i4b

Total Bytes: 4

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: Unique index that relates this record to the corresponding record(s) in each GLAS data product.

Comments:

Product Var Name i_UTCTime

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Transmit Time of First Shot in frame in J2000

Product Data Type: i4b (2)

Total Bytes: 8

Product Units: seconds, microseconds

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: The transmit time of the first shot in the 1 second frame measured as 'UTC seconds' elapsed since Jan 1 2000 12:00:00 UTC. This time has been derived from the GPS time accounting for leap seconds. The first item is the whole number of seconds; the second item is the fractional part in microseconds.

Comments: This is not the ground bounce time, but the transmit time.

Product Var Name i_gla01_rectype

Is element of: GLA01 Main Record

Short Description: GLA01 Record Type

Product Data Type: i2b

Total Bytes: 2

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2

Description: Record type indicating whether this record is a invalid = 0, main=1, long=2, or short=3 waveform record.

Comments:

Product Var Name i_spare1

Is element of: GLA01 Main Record

Short Description: Spares 1

Product Data Type: i2b

Total Bytes: 2

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: GLA01 spare1.

Product Var Name i_dShotTime

Is element of: GLA01 Main Record, GLA04 LPA Main Record, GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Laser Shot Time Deltas (shots 2-40)

Product Data Type: i4b (39)

Total Bytes: 156

Product Units: microseconds

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1200000

Description: The time deltas of pulses 2 through 40 to i_UTCTime, the UTC time tag of the first pulse in the 1-second data frame. Adding the deltas to i_UTCTime will give the user the time of each individual shot in the frame.

Comments: To calculate the time for shots 2-40, add these deltas to the time of the first shot.

Product Var Name i_i1_pred_lat

Is element of: GLA01 Main Record, GLA02 Record

Short Description: Predicted geodetic Latitude of the laser footprint

Product Data Type: i4b

Total Bytes: 4

Product Units: microdegrees

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -90000000

Product Maximum: 90000000

Description: The geodetic Latitude of the laser footprint; obtained from the predicted orbit; assuming the laser is nadir pointing.

Comments:

Product Var Name i1_pred_lon

Is element of: GLA01 Main Record, GLA02 Record

Short Description: Predicted geodetic Longitude of the laser footprint

Product Data Type: i4b

Total Bytes: 4

Product Units: microdegrees

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 360000000

Description: The geodetic Longitude of the laser footprint; obtained from the predicted orbit; assuming the laser is nadir pointing.

Comments:

Product Var Name i_RespEndTime

Is element of: GLA01 Main Record

Short Description: Ending Address of Range Response

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: nanoseconds

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 5100000

Description: Address (in digitizer counts) of the 2000-byte surface echo data dump (as measured from the start of Acquisition Memory, i.e. Start of digitization). Last in time. From APID12/13 offset 80.

Comments:

Product Var Name i_LastThrXingT

Is element of: GLA01 Main Record

Short Description: Last Threshold Crossing Location for Selected Filter

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: ns

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 5100000

Description: Address, in digitizer counts, of the detected last (i.e. last in time) threshold crossing (as measured from the start of Acquisition Memory, i.e. Start of digitization). Also called the trailing edge. Set to 0 if threshold crossing was NOT detected. From APID12/13, Offset 84.

Comments: null

Product Var Name i_NextThrXing

Is element of: GLA01 Main Record

Short Description: Next to Last Threshold Crossing Location for Selected Filter

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: ns

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 5100000

Description: Address (in digitizer counts) of the detected next to last threshold crossing (as measured from the start of Acquisition Memory, i.e. Start of digitization. Also called the leading edge. Set to 0 if a threshold crossing was NOT detected. From APID12/13 offset 88.

Comments:

Product Var Name i_EchoPeakLoc

Is element of: GLA01 Main Record

Short Description: Echo Peak Location

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: nanoseconds

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 5100000

Description: Address (in digitizer counts) of the detected peak value (as measured from the start of Acquisition Memory, i.e. Start of digitization). Set to 0 if a threshold crossing was NOT detected. From APID12/13 offset 100.

Comments:

Product Var Name i_EchoPeakVal

Is element of: GLA01 Main Record

Short Description: Echo Peak Value

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 255

Description: Peak value for the selected filter returned by the FIR filter engine. Set to 0 if a threshold crossing was not detected. From APID12/13 offset 96.

Comments:

Product Var Name i_wt_fact_filt

Is element of: GLA01 Main Record

Short Description: Filter Weight Factors

Product Data Type: i4b (6, 40)

Total Bytes: 960

Product Units: unitless

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2000000000

Description: Results of weight formulas for all FIR filters. There are a total of 6 filters. From APID12/13, offset 124.

Comments:

Product Var Name i_filtr_thresh

Is element of: GLA01 Main Record

Short Description: Selected Filter Threshold Value

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 255

Description: Threshold values used to find the last and next to last threshold crossings for the selected filter. From APID12/13, Offset 108.

Comments:

Product Var Name i_time_txWfPk

Is element of: GLA01 Main Record, GLA04 LPA Main Record

Short Description: Transmit Pulse Peak Location

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: ns

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 500000

Description: Address in digitizer counts of the Transmit Pulse Peak as measured from the start of Acquisition Memory, i.e. start of digitization. From APID12/13, Offset 68.

Comments: The range measurement starts from this time. To accurately time stamp the transmit pulse, it is necessary to add the delay to start of digitizer.

Product Var Name i_TxWfStart

Is element of: GLA01 Main Record, GLA04 LPA Main Record

Short Description: Starting Address of Transmit Pulse Sample

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: ns

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 500000

Description: Starting Address in digitizer counts of the Transmit Pulse sample relative to the start of digitization. From APID12/13, Offset 76.

Comments:

Product Var Name i_TxNrg_EU

Is element of: GLA01 Main Record

Short Description: 1064 nm Laser Transmit Energy

Product Data Type: i4b

Total Bytes: 4

Product Units: microjoules

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 90000

Description: The 1064 nm laser pulse transmitted energy in energy units, computed from the digitized outgoing pulse, and the transmit gain.

Comments:

Product Var Name i_RecNrgAll_EU

Is element of: GLA01 Main Record

Short Description: 1064 Laser received Energy from all signal above threshold

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: attojoules

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 200000

Description: This is calculated by taking the area under the received waveform (referenced to the observed noise) from all responses between the noise crossing before the first threshold crossing and the noise crossing after the last threshold crossing.

Comments:

Product Var Name i_RecNrgLast_EU

Is element of: GLA01 Main Record

Short Description: 1064 nm Laser Received Energy (max pk)

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: attojoules

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 200000

Description: This is the energy in the 1064 nm laser pulse between the threshold crossings before and after the maximum amplitude in energy units.

Comments:

Product Var Name i_txWfPk_Flag

Is element of: GLA01 Main Record, GLA04 LPA Main Record

Short Description: Transmit Waveform Peak Status Flag

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 8

Description: Transmit_Peak_Status. Status Word: Bit 0: If bit is set to 1 (true), then internal software failure. Bit 1: If bit is set to 1 (true), then peak is below threshold. Bit 2: If bit is set to 1 (true), peak was not found. Note: once set to true, Bit 2 is latched and is only cleared by a DSP board reset or by a ground command. From APID12/13, Offset 72. Please see the PDF flag description in the next section for more details.

Comments:

Product Var Name i_InstState

Is element of: GLA01 Main Record

Short Description: Instrument State

Product Data Type: i4b

Total Bytes: 4

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 524288

Description: Flag defining current configuration of the GLAS instrument. This is a common flag. Please see the PDF flag description in the next section for more details.

Comments:

Product Var Name i_APID_AvFlg

Is element of: GLA01 Main Record, GLA02 Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: APID Data Availability Flag

Product Data Type: i1b (8)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -127

Product Maximum: 127

Description: Flag indicating which packets (APIDs) for each second are available missing, or filled. APID 19 is broken down further into Altimeter Digitizer, Photon Counter, Cloud Digitizer, GPS/DEM, and C&T sections.

Please see the PDF flag description in the next section for more details.

Comments:

Product Var Name i_FiltNumMask

Is element of: GLA01 Main Record

Short Description: Filter Selection Mask

Product Data Type: i4b

Total Bytes: 4

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 64

Description: The low order 6 bits, bits 0 through 5, indicate which filters were selectable for a shot. The definition of complete failure of the filters has been changed to mean the complete failure of all SELECTABLE filters. Bit 0: 4 nsec filter, bit 1: 8 nsec filter, bit 2: 16 nsec filter, bit 3: 32 nsec filter, bit 4: 64 nsec filter, bit 5: 128 nsec filter. In case of the complete failure of all the filters, the result of the last 'good' shot shall be used, even if this mask proscribes the filter choice. A bit value = 1 =selectable; bit value = 0 = not selectable. From APID19, Offset 30. Please see the PDF flag description in the next section for more details.

Comments:

Product Var Name i_HOff

Is element of: GLA01 Main Record

Short Description: DEM Offset

Product Data Type: i4b (2)

Total Bytes: 8

Product Units: Millimeters

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -1.0D9

Product Maximum: 1.0D9

Description: Offsets associated with the minimum and maximum height uploaded in the DEM used to define the range window. 1st item: minimum height offset = DEM uncertainty + bias; default is 1.125 km. 2nd item: maximum height offset = DEM uncertainty - bias; default is -0.875 km. From APID19, Offset 1116.

Comments:

Product Var Name i_ADBias

Is element of: GLA01 Main Record

Short Description: Altimeter Digitizer Bias

Product Data Type: i4b (2)

Total Bytes: 8

Product Units: Meters

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -1000000

Product Maximum: 1000000

Description: Altimeter Digitizer bias values added to minimum and maximum range: 1st item is bias for minimum range (Rbmin) - default = 0; 2nd item is bias for maximum range (Rbmax) - default = 0. Used when necessary to correct for off-nadir pointing angles greater than 1 degree. From APID19, Offset 1124.

Comments:

Product Var Name i_RminRmax

Is element of: GLA01 Main Record

Short Description: Range Window Start and Stop

Product Data Type: i4b (2)

Total Bytes: 8

Product Units: Meters

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1000000

Description: Range window start and stop in kilometers. From APID19, Offset 1100.

Comments:

Product Var Name i_WMinMax

Is element of: GLA01 Main Record

Short Description: Window Size

Product Data Type: i4b (2)

Total Bytes: 8

Product Units: Meters

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1000000

Description: Range window minimum and maximum size. 1st item is minimum - default is 2 km; 2nd item is maximum - default is 11 km. From APID19, Offset 1108.

Comments:

Product Var Name i_ObSCHt

Is element of: GLA01 Main Record

Short Description: On-board Height of S/C

Product Data Type: i4b

Total Bytes: 4

Product Units: Millimeters

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -1.0D9

Product Maximum: 1.0D9

Description: Geodetic altitude of S/C above earth surface (Hsat). From APID19, Offset 1092.

Comments:

Product Var Name i_engineering

Is element of: GLA01 Main Record

Short Description: Engineering Data

Product Data Type: i2b (12)

Total Bytes: 24

Product Units: various

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -3000

Product Maximum: 5000

Description: The following is from /glas/vob/src/l1a_lib/L_EngCorr_mod.f90 which is called by L1AMgr:

d_engineering(1) = active detector temperature [T_detID

if detector=1, T_detID = GLA00_prod%CTHW3_hk(1)%i_PRTad1C24_t

if detector=2, T_detID = GLA00_prod%CTHW3_hk(1)%i_PRTad2C25_t]

d_engineering(2) = active digitizer temperature [T_digID

if digitizer=1, T_digID = GLA00_prod%CTHW3_hk(1)%i_AD1ADCC19_t

if digitizer=2, T_digID = GLA00_prod%CTHW3_hk(1)%i_AD2ADCC20_t]

d_engineering(3) = oscillator board temperature

[T_relay = GLA00_prod%CTHW3_hk(1)%i_OscBdC11_t]

d_engineering(4) = Fiber Box temperature

[T_fb = GLA00_prod%CTHW3_hk(1)%i_PRTfboxC29_t]

d_engineering(5) thru d_engineering(12) TBD. All temperatures are in Celsius X 100.

Comments: Engineering data (temperatures, voltages, currents) affecting the altimetry data. Array of 12 values.

Product Var Name i_compRatio

Is element of: GLA01 Main Record, GLA05 record

Short Description: Compression Ratios

Product Data Type: i2b (2)

Total Bytes: 4

Product Units: unitless

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 1

Product Maximum: 5

Description: Averaging values p and q for frame. First item is p; second is q. From APID19, Offset 232. First N downlink samples are generated by averaging p raw digitized elements and the rest of the allocated samples in the waveform by averaging q elements.

Comments: Not valid if APID19 is missing.

Product Var Name i_N_val

Is element of: GLA01 Main Record, GLA05 record

Short Description: Value of N

Product Data Type: i2b

Total Bytes: 2

Product Units: gates

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 544

Description: Value of N used for waveform compression for the frame. From APID19, Offset 236.

Comments: Not valid if APID19 is missing.

Product Var Name i_r_val

Is element of: GLA01 Main Record, GLA05 record

Short Description: Value of r

Product Data Type: i2b

Total Bytes: 2

Product Units: unitless

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 8

Description: Value of r used for waveform compression for frame. From APID19, Offset 238. Not valid if APID19 is missing.

Comments: After M shots with no valid return, the 'p' and 'q' averaging of the normal downlinked waveform compression type will be overridden and instead the telemetered received echo will consist of average samples averaged over 'r' raw samples.

Product Var Name i_ADdetOutGn

Is element of: GLA01 Main Record

Short Description: Transmitted Gain

Product Data Type: i2b

Total Bytes: 2

Product Units: counts

Invalid Value/Flag: N/A

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 255

Description: AD Detector Return Gain readback

Comments: This is only updated every 4 seconds.

Product Var Name i_DEMmin

Is element of: GLA01 Main Record

Short Description: DEM minimum

Product Data Type: i2b

Total Bytes: 2

Product Units: meters

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -1000

Product Maximum: 12000

Description: Onboard spacecraft DEM minimum elevation used to calculate hmin. From APID19, Offset 1192.

Comments:

Product Var Name i_DEMmax

Is element of: GLA01 Main Record

Short Description: DEM maximum

Product Data Type: i2b

Total Bytes: 2

Product Units: meters

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -1000

Product Maximum: 12000

Description: Onboard spacecraft DEM maximum elevation used to calculate hmax. From APID19, Offset 1193.

Comments:

Product Var Name i_tx_wf

Is element of: GLA01 Main Record, GLA04 LPA Main Record

Short Description: Sampled Transmit Pulse Waveform

Product Data Type: i1b (48, 40)

Total Bytes: 1920

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: Transmit Pulse; 48 bytes of raw data samples.

Comments:

Product Var Name i_OrbFlg

Is element of: GLA01 Main Record, GLA02 Record, GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: POD flag (Orbit Flag)

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 128

Description: Denotes quality of orbit, whether predicted or precision, loss of GPS data, maneuver-degraded, etc. Please see the PDF flag description in the next section for more details.

Comments:

Product Var Name i_EchoLandType

Is element of: GLA01 Main Record

Short Description: Echo Land Type

Product Data Type: i1b

Total Bytes: 1

Product Units: unitless

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 3

Description: Surface Echo Land Type for Compression. 0=sea, 1=land, 2=sea/ice, 3=land/ice. From APID19, Offset 231.

Comments: The long and short values and values of 'p', 'q', and 'N' are surface echo land type dependent, but can only change once per frame (1sec).

Product Var Name i_RngSrc_Flag

Is element of: GLA01 Main Record

Short Description: Range Data Source

Product Data Type: i1b

Total Bytes: 1

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2

Description: Source of Range data: 0 = s/c time and position packet; 1 = uplinked DEM bytes; 2 = uplinked Rmin/Rmax. Please see the PDF flag description in the next section for more details. From APID19, Offset 1194.

Comments:

Product Var Name i_timecorflg

Is element of: GLA01 Main Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: time correction flag

Product Data Type: i2b

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: Indicates what instrument or bias corrections were applied to the times on this record. Please see the PDF flag description in the next section for more details.

Comments:

Product Var Name i_TxFlg

Is element of: GLA01 Main Record

Short Description: Transmit Pulse Flag

Product Data Type: i1b (5)

Total Bytes: 5

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -127

Product Maximum: 127

Description: Flag indicating whether the transmit pulse is telemetered (valid) or not telemetered (invalid) in this record (1 bit set/shot). See the PDF flag description in the next section for more information.

Comments:

Product Var Name i_GainShiftFlg

Is element of: GLA01 Main Record

Short Description: Gain Shift Flag

Product Data Type: i1b (5)

Total Bytes: 5

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -127

Product Maximum: 127

Description: Flag indicates if the gain has been shifted for the corresponding measurement. 0=Gain has been shifted (valid) or 1=Gain has not been shifted (potentially invalid) in this record (1 bit set/shot). See the PDF flag description in the next section for more information.

Comments:

Product Var Name i_spare2

Is element of: GLA01 Main Record

Short Description: Spare 2

Product Data Type: i1b (10)

Total Bytes: 10

Product Units: null

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: GLA01 spare2.

Product Var Name i_rec_ndx

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: GLAS Record Index

Product Data Type: i4b

Total Bytes: 4

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: Unique index that relates this record to the corresponding record(s) in each GLAS data product.

Comments:

Product Var Name i_UTCTime

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Transmit Time of First Shot in frame in J2000

Product Data Type: i4b (2)

Total Bytes: 8

Product Units: seconds, microseconds

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: The transmit time of the first shot in the 1 second frame measured as 'UTC seconds' elapsed since Jan 1 2000 12:00:00 UTC. This time has been derived from the GPS time accounting for leap seconds. The first item is the whole number of seconds; the second item is the fractional part in microseconds.

Comments: This is not the ground bounce time, but the transmit time.

Product Var Name i_gla01_rectype

Is element of: GLA01 Long Waveform Record

Short Description: GLA01 Record Type

Product Data Type: i2b

Total Bytes: 2

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2

Description: Record type indicating whether this record is a invalid=0, main=1, long=2, or short=3 waveform record.

Comments:

Product Var Name i_spare1

Is element of: GLA01 Long Waveform Record

Short Description: Spares 1

Product Data Type: i2b

Total Bytes: 2

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_filtnum

Is element of: GLA01 Long Waveform Record

Short Description: Filter Number

Product Data Type: i1b (8)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 5

Description: Filter with the highest weight (0 for 4 nsec filter; 1 for 8 nsec filter; 2 for 16 nsec filter; 3 for 32 nsec filter; 4 for 64 nsec filter; 5 for 128 nsec filter). May or may not be selectable! If no selectable filter can be chosen, then the last successful filter, selectable or NOT is chosen. From APID12/13, Offset 104.

Comments:

Product Var Name i_shot_ctr

Is element of: GLA01 Long Waveform Record

Short Description: Shot Counter

Product Data Type: i2b (8)

Total Bytes: 16

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 200

Description: The shot number for each of the 40 shots in this record. The shot count rolls over after reaching 200. From APID12/13, Offset 16.

Comments:

Product Var Name i_statflags

Is element of: GLA01 Long Waveform Record

Short Description: Range Window Status Word

Product Data Type: i4b (8)

Total Bytes: 32

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 262144

Description: Range Window Status word: Bit 0: No first crossing found on 4-nsec filter Bit 1: No first crossing found on 8-nsec filter Bit 2: No first crossing found on 16-nsec filter Bit 3: No first crossing found on 32-nsec filter Bit 4: No first crossing found on 64-nsec filter Bit 5: No first crossing found on 128-nsec filter Bit 6: No second

crossing found on 4-nsec filter Bit 7: No second crossing found on 8-nsec filter Bit 8: No second crossing found on 6-nsec filter Bit 9: No second crossing found on 32-nsec filter Bit 10: No second crossing found on 64-nsec filter Bit 11: No second crossing found on 128-nsec filter Bit 12: First sample in range greater than or equal to threshold for 4 nsec filter Bit 13: First sample in range >= to threshold for 8 nsec filter Bit 14: First sample in range >= threshold for 16 nsec filter Bit 15: First sample in range >= threshold for 32 nsec filter Bit 16: First sample in range >= threshold for 64 nsec filter Bit 17: First sample in range >= threshold for 128 nsec filter Bit 18: All filters were rejected flag. 0 = FALSE, 1 = TRUE. This flag will be set to true (1) if bits 0 through 5 in Range_Status are set. Bits 19-31 are unused spares. Please see <a href='flags/i_statflags.pdf'> the PDF flag description in the next section for more details. From APID12/13, Offset 120.

Comments:

Product Var Name i_gainSet1064

Is element of: GLA01 Long Waveform Record

Short Description: AD Gain Setting

Product Data Type: i2b (8)

Total Bytes: 16

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 255

Description: The receiver gain; results of the gain algorithm. From APID12/13, Offset 148.

Comments:

Product Var Name i_4nsPeakVal

Is element of: GLA01 Long Waveform Record

Short Description: 4ns Filter Peak value

Product Data Type: i2b (8)

Total Bytes: 16

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 255

Description: Received pulse Peak value for the 4ns filter; returned by the FIR engine. From APID12/13, Offset 92.

Comments:

Product Var Name i_8nsPeakVal

Is element of: GLA01 Long Waveform Record

Short Description: 8ns Filter Peak value

Product Data Type: i2b (8)

Total Bytes: 16
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 255
Description: Received pulse Peak value for the 8ns filter; returned by the FIR engine. From APID12/13, Offset 94.
Comments:

Product Var Name i_4nsBgMean
Is element of: GLA01 Long Waveform Record
Short Description: Background Mean Value
Product Data Type: i2b (8)
Total Bytes: 16
Product Units: .01 counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 51200
Description: Background Noise Mean Value for the 4 ns filter. From APID12/13, Offset 112.
Comments:

Product Var Name i_4nsBgSDEV
Is element of: GLA01 Long Waveform Record
Short Description: Background Standard Deviation
Product Data Type: i2b (8)
Total Bytes: 16
Product Units: .01 counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 51200
Description: The standard deviation of the background noise for the 4 ns filter. From APID12/13, Offset 116.
Comments:

Product Var Name i_samp_pad
Is element of: GLA01 Long Waveform Record

Short Description: Echo Sample Padding

Product Data Type: i2b (8)

Total Bytes: 16

Product Units: gates

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 544

Description: Surface echo sample padding. Number of zero bytes used to pad the surface echo data samples after averaging. From APID12/13, Offset 152.

Comments:

Product Var Name i_comp_type

Is element of: GLA01 Long Waveform Record

Short Description: Echo Compression Type

Product Data Type: i1b (8)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1

Description: Surface echo compression type. Indicates the type of compression performed. 0 = N, p, and q; 1 = r. From APID12/13, Offset 154.

Comments:

Product Var Name i_rng_wf

Is element of: GLA01 Long Waveform Record

Short Description: 1064 nm Range Waveform

Product Data Type: i1b (544, 8)

Total Bytes: 4352

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: The 1064 nm echo waveform digitizer sample output, at 544 samples per shot over land and ice sheet and 200 samples per shot over sea ice and ocean. The surface type is determined by the instrument from

the on-board DEM. The digitized data was averaged according to the waveform compression parameters (M,N) and the compression ratio (p, q, and r).

Comments: This has no calibration applied. The calibration is applied internally during ground science algorithm processing. The calibration constants are available on ANC07 file.

Product Var Name i_gainStatus

Is element of: GLA01 Long Waveform Record

Short Description: Gain Status Bits

Product Data Type: i1b (8)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: Note that these bits are always set to 0 on the first shot of a science run and when auto gain is disabled.

bit 0x1: 0 if the gain loop was run for this shot;

1 if the gain loop was bypassed for this shot;

bit 0x2: 0 if the gain loop did not time out;

1 if the gain loop timed out and was reset;

Comments:

Product Var Name i_NumCoinc

Is element of: GLA01 Long Waveform Record

Short Description: Number of Coincidences for Selected Filter

Product Data Type: i1b (8)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: The number of coincidences between the selected filter and all other filters (including itself). This is one of the terms used to calculate the weight of the selected filter. If no filter is selected, this value is 0.

Comments:

Product Var Name i_rawPkHt

Is element of: GLA01 Long Waveform Record

Short Description: Height of Peak in Raw Waveform

Product Data Type: i1b (8)

Total Bytes: 8

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: The maximum raw value in a specified range at the end of the return waveform. This value is used as the input to the gain control loop in place of the 8ns peak height.

Comments:

Product Var Name i_spare2

Is element of: GLA01 Long Waveform Record

Short Description: Spare 2

Product Data Type: i1b (108)

Total Bytes: 108

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: GLA01_long spare2.

Product Var Name i_rec_ndx

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: GLAS Record Index

Product Data Type: i4b

Total Bytes: 4

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: Unique index that relates this record to the corresponding record(s) in each GLAS data product.

Comments:

Product Var Name i_UTCTime

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Transmit Time of First Shot in frame in J2000

Product Data Type: i4b (2)

Total Bytes: 8

Product Units: seconds, microseconds

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: The transmit time of the first shot in the 1 second frame measured as 'UTC seconds' elapsed since Jan 1 2000 12:00:00 UTC. This time has been derived from the GPS time accounting for leap seconds. The first item is the whole number of seconds; the second item is the fractional part in microseconds.

Comments: This is not the ground bounce time, but the transmit time.

Product Var Name i_gla01_rectype

Is element of: GLA01_Short_Record

Short Description: GLA01 Record Type

Product Data Type: i2b

Total Bytes: 2

Product Units: null

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2

Description: Record type indicating whether this record is a invalid=0, main=1, long=2, or short=3 waveform record.

Comments:

Product Var Name i_spare1

Is element of: GLA01_Short_Record

Short Description: Spare 1

Product Data Type: i2b

Total Bytes: 2

Product Units: null

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_filtnum

Is element of: GLA01_Short_Record

Short Description: Filter Number

Product Data Type: i1b (20)

Total Bytes: 20

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 5

Description: Filter with the highest weight (0 for 4 nsec filter; 1 for 8 nsec filter; 2 for 16 nsec filter; 3 for 32 nsec filter; 4 for 64 nsec filter; 5 for 128 nsec filter). May or may not be selectable! If no selectable filter can be chosen, then the last successful filter, selectable or NOT is chosen. From APID12/13, Offset 104.

Comments:

Product Var Name i_shot_ctr

Is element of: GLA01_Short_Record

Short Description: Shot Counter

Product Data Type: i2b (20)

Total Bytes: 40

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 200

Description: The shot number for each of the 40 shots in this record. The shot count rolls over after reaching 200. From APID12/13, Offset 16.

Comments:

Product Var Name i_statflags

Is element of: GLA01_Short_Record

Short Description: Range Window Status Word

Product Data Type: i4b (20)

Total Bytes: 80

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 262144

Description: Range Window Status word: Bit 0: No first crossing found on 4-nsec filter Bit 1: No first crossing found on 8-nsec filter Bit 2: No first crossing found on 16-nsec filter Bit 3: No first crossing found on 32-nsec filter Bit 4: No first crossing found on 64-nsec filter Bit 5: No first crossing found on 128-nsec filter Bit 6: No second crossing found on 4-nsec filter Bit 7: No second crossing found on 8-nsec filter Bit 8: No second crossing found on 6-nsec filter Bit 9: No second crossing found on 32-nsec filter Bit 10: No second crossing found on 64-nsec filter Bit 11: No second crossing found on 128-nsec filter Bit 12: First sample in range greater than or equal to threshold for 4 nsec filter Bit 13: First sample in range >= to threshold for 8 nsec filter Bit 14: First sample in range >= threshold for 16 nsec filter Bit 15: First sample in range >= threshold for 32 nsec filter Bit 16: First sample in range >= threshold for 64 nsec filter Bit 17: First sample in range >= threshold for 128 nsec filter Bit 18: All filters were rejected flag. 0 = FALSE, 1 = TRUE. This flag will be set to true (1) if bits 0 through 5 in Range_Status are set. Bits 19-31 are unused spares. Please see <a href='flags/i_statflags.pdf'> the PDF flag description in the next section for more details. From APID12/13, Offset 120.

Comments:

Product Var Name i_gainSet1064

Is element of: GLA01_Short_Record

Short Description: AD Gain Setting

Product Data Type: i2b (20)

Total Bytes: 40

Product Units: unitless

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: No

Is Unsigned?: NA

Product Minimum: 0

Product Maximum: 255

Description: The receiver gain; results of the gain algorithm. From APID12/13, Offset 148.

Comments: This number has calibrations applied so will differ from the value on the APID12/13.

Product Var Name i_4nsPeakVal

Is element of: GLA01_Short_Record

Short Description: 4ns Filter Peak Value

Product Data Type: i2b (20)

Total Bytes: 40

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: No
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 255
Description: Received pulse Peak value for the 4ns filter; returned by the FIR engine. From APID12/13, Offset 92.
Comments:

Product Var Name i_8nsPeakVal
Is element of: GLA01_Short_Record
Short Description: 8ns Filter Peak Value
Product Data Type: i2b (20)
Total Bytes: 40
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: No
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 255
Description: Received pulse Peak value for the 8ns filter; returned by the FIR engine. From APID12/13, Offset 94.
Comments:

Product Var Name i_4nsBgMean
Is element of: GLA01_Short_Record
Short Description: Background Mean Value
Product Data Type: i2b (20)
Total Bytes: 40
Product Units: .01 counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 51200
Description: Background Noise Mean Value for the 4 ns filter. From APID12/13, Offset 112.
Comments:

Product Var Name i_4nsBgSDEV
Is element of: GLA01_Short_Record
Short Description: Background Standard Deviation
Product Data Type: i2b (20)

Total Bytes: 40

Product Units: .01 counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 51200

Description: The standard deviation of the background noise for the 4 ns filter. From APID12/13, Offset 116

Comments:

Product Var Name i_samp_pad

Is element of: GLA01_Short_Record

Short Description: Echo Sample Padding

Product Data Type: i2b (20)

Total Bytes: 40

Product Units: gates

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 544

Description: Surface echo sample padding. Number of zero bytes used to pad the surface echo data samples after averaging. From APID12/13, Offset 152.

Comments:

Product Var Name i_comp_type

Is element of: GLA01_Short_Record

Short Description: Echo Compression Type

Product Data Type: i1b (20)

Total Bytes: 20

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1

Description: Surface echo compression type. Indicates the type of compression performed. 0 = N, p, and q; 1 = r. From APID12/13, Offset 154.

Comments:

Product Var Name i_rng_wf

Is element of: GLA01_Short_Record

Short Description: 1064 nm Range Waveform

Product Data Type: i1b (200, 20)

Total Bytes: 4000

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: The 1064 nm echo waveform digitizer sample output, at 544 samples per shot over land and ice sheet and 200 samples per shot over sea ice and ocean. The surface type is determined by the instrument from the on-board DEM. The digitized data was averaged according to the waveform compression parameters (M,N) and the compression ratio (p, q, and r).

Comments: This has no calibration applied. The calibration is applied internally during ground science algorithm processing. The calibration constants are available on ANC07 file.

Product Var Name i_gainStatus

Is element of: GLA01_Short_Record

Short Description: Gain Status Bits

Product Data Type: i1b (20)

Total Bytes: 20

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: NA

Product Minimum: 0

Product Maximum: 255

Description: Note that these bits are always set to 0 on the first shot of a science run and when auto gain is disabled.

bit 0x1: 0 if the gain loop was run for this shot;

1 if the gain loop was bypassed for this shot;

bit 0x2: 0 if the gain loop did not time out;

1 if the gain loop timed out and was reset;

Comments:

Product Var Name i_NumCoinc

Is element of: GLA01_Short_Record

Short Description: Number of Coincidences for Selected Filter

Product Data Type: i1b (20)

Total Bytes: 20

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: The number of coincidences between the selected filter and all other filters (including itself). This is one of the terms used to calculate the weight of the selected filter. If no filter is selected, this value is 0.

Comments:

Product Var Name i_rawPkHt

Is element of: GLA01_Short_Record

Short Description: Height of Peak in Raw Waveform

Product Data Type: i1b (20)

Total Bytes: 20

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: The maximum raw value in a specified range at the end of the return waveform. This value is used as the input to the gain control loop in place of the 8ns peak height.

Comments:

Product Var Name i_spare2

Is element of: GLA01_Short_Record

Short Description: Spare 2

Product Data Type: i1b (184)

Total Bytes: 184

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: GLA01_short spare2.

Product Var Name i_rec_ndx

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04

LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: GLAS Record Index

Product Data Type: i4b

Total Bytes: 4

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: Unique index that relates this record to the corresponding record(s) in each GLAS data product.

Comments:

Product Var Name i_UTCTime

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Transmit Time of First Shot in frame in J2000

Product Data Type: i4b (2)

Total Bytes: 8

Product Units: seconds, microseconds

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: The transmit time of the first shot in the 1 second frame measured as 'UTC seconds' elapsed since Jan 1 2000 12:00:00 UTC. This time has been derived from the GPS time accounting for leap seconds. The first item is the whole number of seconds; the second item is the fractional part in microseconds.

Comments: This is not the ground bounce time, but the transmit time.

Product Var Name i1_pred_lat

Is element of: GLA01 Main Record, GLA02 Record

Short Description: Predicted geodetic Latitude of the laser footprint

Product Data Type: i4b

Total Bytes: 4

Product Units: microdegrees

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -90000000

Product Maximum: 90000000

Description: The geodetic Latitude of the laser footprint; obtained from the predicted orbit; assuming the laser is nadir pointing.

Comments:

Product Var Name i1_pred_lon

Is element of: GLA01 Main Record, GLA02 Record

Short Description: Predicted geodetic Longitude of the laser footprint

Product Data Type: i4b

Total Bytes: 4

Product Units: microdegrees

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 360000000

Description: The geodetic Longitude of the laser footprint; obtained from the predicted orbit; assuming the laser is nadir pointing.

Comments:

Product Var Name i_DEMmin

Is element of: GLA02 Record

Short Description: DEM minimum

Product Data Type: i2b

Total Bytes: 2

Product Units: meters

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -1000

Product Maximum: 12000

Description: Onbroard spacecraft DEM minimum elevation used to calculate hmin. From APID19, Offset 1192.

Comments:

Product Var Name i_DEMmax

Is element of: GLA02 Record

Short Description: DEM maximum

Product Data Type: i2b

Total Bytes: 2

Product Units: meters

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -1000

Product Maximum: 12000

Description: Onboard spacecraft DEM maximum elevation used to calculate hmax. From APID19, Offset 1193.

Comments:

Product Var Name i_g_lid_qf

Is element of: GLA02 Record

Short Description: 532 nm LIDAR Data Quality Flag

Product Data Type: i1b (12)

Total Bytes: 12

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 3

Description: 532 nm lidar data quality flag. 2 bits per shot for the 40 HZ profile; 2 bits per sum for the 5 Hz profile, 2 bits for the 1 Hz profile for a total of 92 bits. There are 4 spare bits. A value of 3 indicates the background data is out of bounds (0-100).

Please see <a href='flags/i_g_lid_qf.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i40_g_lid

Is element of: GLA02 Record

Short Description: 532 nm LIDAR Data from 10 KM to -1 KM

Product Data Type: i4b (148, 40)

Total Bytes: 23680

Product Units: ((pe/bin)KM^2)/J)/1000

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -10000

Product Maximum: 100000000

Description: The normalized lidar signal from the 532 nm photon counting channel for the 10 KM to -1 segment of the atmosphere. Background subtraction, range squared, and dead time correction is applied. NOTES: pe = photons; J = Joules.

Comments:

Product Var Name i5_g_lid

Is element of: GLA02 Record

Short Description: 532 nm LIDAR Data from 20 KM to 10 KM

Product Data Type: i4b (132, 5)

Total Bytes: 2640

Product Units: ((pe/bin)KM^2)/J)/1000

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -10000

Product Maximum: 100000000

Description: The normalized lidar signal from the 532 nm photon counting channel for the 20 KM to 10 KM segment of the atmosphere. Background subtraction, range squared, and dead time correction is applied. Sums of 8 samples.

Comments:

Product Var Name i1_g_lid

Is element of: GLA02 Record

Short Description: 532 nm LIDAR Data from 40 KM to 20 KM

Product Data Type: i4b (268)

Total Bytes: 1072

Product Units: ((pe/bin)KM^2)/J)/1000

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -10000

Product Maximum: 100000000

Description: The normalized lidar signal from the 532 nm photon counting channel for the 40 KM to 20 KM segment of the atmosphere. Background subtraction, range squared, and dead time correction is applied.

Comments:

Product Var Name i40_g_sat_f

Is element of: GLA02 Record

Short Description: 532 nm Saturation Flag for 10 to -1 KM Segment

Product Data Type: i1b (740)

Total Bytes: 740

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 1

Description: Bit flag indicating whether the 532 nm signal is saturated or not for the 10 to -1 KM profile. 0 = not saturated, 1 = saturated. 1 bit flag per each bin in the profile. There are 148 bins in the profile and the profiles occur at 40 per second for a total of 5920 flags (148 * 40) per second. Bits 0-147 are the flags for shot 1, Bits 148-295 are the flags for shot 2, etc.

Please see <a href='flags/i40_g_sat_f.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i5_g_sat_f

Is element of: GLA02 Record

Short Description: 532 nm Saturation Flag for 20 to 10 KM Segment

Product Data Type: i1b (84)

Total Bytes: 84

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 1

Description: Bit flag indicating whether the 532 nm signal is saturated or not for the 20 to 10 KM Profile. 0 = not saturated, 1 = saturated. There is one flag per each bin in the profile. There are 132 bins in a profile and the profiles are summed over 8 shots for a total of 660 flags (132 * 5) per second. Bits 0-131 are the flags for shots 1-8, Bits 132-263 are the flags for shots 9-16, etc. The upper 12 bits are spares.

Please see <a href='flags/i5_g_sat_f.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i1_g_sat_f

Is element of: GLA02 Record

Short Description: 532 nm Saturation Flag for 40 to 20 KM Segment

Product Data Type: i1b (36)

Total Bytes: 36

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 1

Description: Bit flag indicating whether the 532 nm signal is saturated or not for the 40 to 20 KM Segment. 0 = not saturated, 1 = saturated. There is one flag per each bin in the profile. There are 268 bins in a profile and the profile is summed over the 40 shots in a second for a total of 268 flags (268 * 1) per second. The upper 20 bits are spares.

Please see <a href='flags/i1_g_sat_f.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i40_g_TxNrg_EU

Is element of: GLA02 Record, GLA07 Record

Short Description: 532 nm Laser Transmit Energy at 40 Hz

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: Joules * 1.0d5

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 4500

Description: The 532 nm transmitted pulse energy in energy units, converted from the counts from the transmitted energy monitor.

Comments: Not valid if APID19 is missing.

Product Var Name i5_g_TxNrg_EU

Is element of: GLA02 Record, GLA07 Record

Short Description: 532 nm Laser Transmit Energy at 5 Hz

Product Data Type: i4b (5)

Total Bytes: 20

Product Units: Joules * 1.0d5

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 4500

Description: The 532 nm transmitted pulse energy in energy units, converted from the counts from the transmitted energy monitor. Averaged over 8 shots.

Comments: Not valid if APID19 is missing.

Product Var Name i1_g_TxNrg_EU

Is element of: GLA02 Record

Short Description: 532 nm Laser Transmit Energy at 1 Hz

Product Data Type: i4b

Total Bytes: 4

Product Units: Joules * 1.0d5

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 4500

Description: The 532 nm transmitted pulse energy in energy units, converted from the counts from the transmitted energy monitor. Averaged over 40 shots.

Comments:

Product Var Name i_g_IntRet

Is element of: GLA02 Record

Short Description: 532 nm Integrated Return, 40 to 20 KM

Product Data Type: i4b

Total Bytes: 4

Product Units: photons*100

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 500000

Description: Sum of raw photon counts (after background is subtracted) over the 20 to 40 km bins.

Comments:

Product Var Name i_Rng2PCProf

Is element of: GLA02 Record

Short Description: Start Range of 532 nm Backscatter Profile

Product Data Type: i4b

Total Bytes: 4

Product Units: centimeters

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 50000000

Product Maximum: 70000000

Description: The range from the spacecraft to the start of the 532 nm backscatter profile - the start of the 40 KM segment of Lidar Data.

Comments: Not valid if APID19 is missing.

Product Var Name i_Rng_PkRt

Is element of: GLA02 Record

Short Description: Range from spacecraft to peak of return

Product Data Type: i4b

Total Bytes: 4

Product Units: centimeters

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 50000000

Product Maximum: 70000000

Description: Range calculated from the spacecraft to the location of the peak as returned in the telemetry (ground).

Comments:

Product Var Name i40_g_bg

Is element of: GLA02 Record, GLA07 Record

Short Description: 532 nm Background at 40 Hz

Product Data Type: i4b (4, 40)

Total Bytes: 640

Product Units: photons/bin * 100

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 100000

Description: The normalized 532 nm background counts from upper (1) and lower (2) integration intervals.(3) is background used to compute NRB.

Comments: Not valid if APID15 is missing.

Product Var Name i5_g_bg

Is element of: GLA02 Record, GLA07 Record

Short Description: 532 nm Background at 5 Hz

Product Data Type: i4b (4, 5)

Total Bytes: 80

Product Units: photons/bin * 100

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 100000

Description: The normalized 532 nm background counts from upper (1) and lower (2) integration intervals.(3) is background used to compute NRB. Averaged over 8 shots.

Comments: Not valid if APID15 is missing.

Product Var Name i1_g_bg

Is element of: GLA02 Record, GLA07 Record

Short Description: 532nm Background at 1 Hz

Product Data Type: i4b (4)

Total Bytes: 16

Product Units: photons/bin * 100

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 100000

Description: The normalized 532 nm background counts from upper (1) and lower (2) integration intervals. (3) is background used to compute NRB. Averaged over 40 shots.

Comments: Not valid if APID15 is missing.

Product Var Name i_gPredCldTop

Is element of: GLA02 Record

Short Description: 532 nm Predicted Cloud Top Height at 5Hz

Product Data Type: i2b (5)

Total Bytes: 10

Product Units: meters

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 30000

Description: The predicted height of the first cloud above local ground, predicted from the 532 nm lidar signal.

Comments:

Product Var Name i_g_shot_ctr

Is element of: GLA02 Record

Short Description: 532 nm LIDAR Data Shot Counter

Product Data Type: i2b

Total Bytes: 2

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 200

Description: Corresponds to first value of the 40 -1 km to 10 km aerosol science data. From APID15, Offset 14.

Comments:

Product Var Name i_SpcmBg2Del

Is element of: GLA02 Record

Short Description: SPCM Background 2 Delay

Product Data Type: i2b

Total Bytes: 2

Product Units: nanoseconds

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 65535

Description: The delay for the background #2 as read from the photon counter board. From APID19, Offset 586.

Comments:

Product Var Name i_SpcmRngDel

Is element of: GLA02 Record

Short Description: SPCM Range Delay

Product Data Type: i2b

Total Bytes: 2

Product Units: nanoseconds

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 65535

Description: The delay for the range gate as read from the photon counter board. This is the delay from the fire acknowledge to the start of data collection for the 40 KM profile.

Comments:

Product Var Name i_SpcmGateDel

Is element of: GLA02 Record

Short Description: SPCM Gate Delay

Product Data Type: i2b

Total Bytes: 2

Product Units: nanoseconds

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 65535

Description: The SPCM Gate Delay from the photon counter board. This is the delay from the fire acknowledge prior to enabling the SPCMs.

Comments:

Product Var Name i_SpcmBg1Del

Is element of: GLA02 Record

Short Description: SPCM Background 1 Delay

Product Data Type: i2b

Total Bytes: 2

Product Units: nanoseconds

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 65535

Description: The Background #1 Delay from the photon counter board.

Comments:

Product Var Name i_spcm_stat

Is element of: GLA02 Record

Short Description: SPCM Status

Product Data Type: i2b

Total Bytes: 2

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 65280

Description: The status of the SPCM as read from the photon counter board. The Photon Counter Bd address 0xXX800004.

Comments:

Product Var Name i_g_TxNrg_Cts

Is element of: GLA02 Record

Short Description: 532 nm Laser Transmit Energy, counts

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: The 532 nm transmitted pulse energy, in raw counts from the transmitted pulse energy monitor.

Comments:

Product Var Name i_g_TxNrg_qf

Is element of: GLA02 Record, GLA07 Record

Short Description: 532 nm Laser Transmit Energy Quality Flag

Product Data Type: i1b (10)

Total Bytes: 10

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 3

Description: Evaluation of the 532 nm laser transmit energy which is an indication of the laser health; 2 bits per shot for 40 shots; 1 = full laser energy, 2 = marginal laser energy, 3 = deficient laser energy, 0 = not used.

Please see <a href='flags/i_g_TxNrg_qf.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_g_IntRet_qf

Is element of: GLA02 Record

Short Description: Integrated Return Quality Flag

Product Data Type: i1b

Total Bytes: 1

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 5

Description: Assessment of the integrated return value; indicator of boresight accuracy and signal strength. 0 = unused, 1 = excellent, 2 = good, 3 = marginal, 4 = poor, 5 = bad data.

Please see <a href='flags/i_g_IntRet_qf.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_spare2

Is element of: GLA02 Record

Short Description: Spare 2

Product Data Type: i1b

Total Bytes: 1

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_ir_lid_qf

Is element of: GLA02 Record

Short Description: 1064 nm LIDAR Data Quality Flag

Product Data Type: i1b (12)

Total Bytes: 12

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 3

Description: 1064 nm lidar data quality flag. 2 bits per shot for the 40 HZ profile; 2 bits per sum for the 5 Hz profile for a total of 90 bits. The upper 6 bits are spares. A value of 3 indicates the background data is out of bounds (0-255).

Please see <a href='flags/i_ir_lid_qf.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_ir_shot_ctr

Is element of: GLA02 Record

Short Description: 1064 nm Cloud Digitizer Shot Counter

Product Data Type: i2b

Total Bytes: 2

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 200

Description: Shot number corresponding to first value of the 40 -1 km to 10 km cloud digitizer data.

Comments:

Product Var Name i_spcm_cts
Is element of: GLA02 Record
Short Description: SPCM Raw Counts
Product Data Type: i1b (8)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 255
Description: The raw counts for each photon counter (1-8) from the S? Photon Counter Module.
Comments:

Product Var Name i_pc_rbias
Is element of: GLA02 Record
Short Description: Photon Counter Range Bias
Product Data Type: i4b
Total Bytes: 4
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000000
Product Maximum: 1000000
Description: The range bias of the photon counter; always positive.
Comments:

Product Var Name i40_ir_TxNrgEU
Is element of: GLA02 Record, GLA07 Record
Short Description: 1064 nm Laser Transmit Energy at 40 Hz
Product Data Type: i4b (40)
Total Bytes: 160
Product Units: Joules * 1.0d5
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0

Product Maximum: 9000

Description: The 1064 nm laser pulse energy, computed from the digitized outgoing pulse and the detector temperature.

Comments: Not valid if APID19 and APID12 or APID13 are missing.

Product Var Name i5_ir_TxNrgEU

Is element of: GLA02 Record, GLA07 Record

Short Description: 1064 nm Laser Transmit Energy at 5 Hz

Product Data Type: i4b (5)

Total Bytes: 20

Product Units: Joules * 1.0d5

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 9000

Description: The 1064 nm laser pulse energy, computed from the digitized outgoing pulse and the detector temperature. Averaged over 8 shots.

Comments: Not valid if APID19 and APID12 or APID13 are missing.

Product Var Name i_rng2CDProf

Is element of: GLA02 Record

Short Description: Start Range of the 1064 nm Backscatter Profile

Product Data Type: i4b

Total Bytes: 4

Product Units: centimeters

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 50000000

Product Maximum: 70000000

Description: The range from the spacecraft to the start of the 1064 nm backscatter profile - the start of the 20 KM segment of Lidar Data.

Comments:

Product Var Name i40_ir_bg

Is element of: GLA02 Record, GLA07 Record

Short Description: 1064 nm Background at 40 Hz

Product Data Type: i4b (4, 40)

Total Bytes: 640

Product Units: W*1.0d17

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100000000

Product Maximum: 100000000

Description: The normalized 1064 nm background counts from upper (1) and lower (2) integration intervals.(3) is background used to compute NRB.

Comments: Not valid if APID17 is missing.

Product Var Name i5_ir_bg

Is element of: GLA02 Record, GLA07 Record

Short Description: 1064 nm Background at 5 Hz

Product Data Type: i4b (4, 5)

Total Bytes: 80

Product Units: W*1.0d17

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100000000

Product Maximum: 100000000

Description: The normalized 1064 nm background counts from upper (1) and lower (2) integration intervals.(3) is background used to compute NRB. Averaged over 8 shots.

Comments: Not valid if APID15 is missing.

Product Var Name i40_ir_lid

Is element of: GLA02 Record

Short Description: 1064 nm LIDAR Data from 10 KM to -1 KM

Product Data Type: i4b (148, 40)

Total Bytes: 23680

Product Units: (W*KM^2)/J)*1.0d8

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -1000000000

Product Maximum: 1000000000

Description: The normalized lidar signal from the 1064 nm cloud digitizer data for the 10 KM to -1 KM atmospheric segment. Background subtraction, and range squared correction is applied.

Comments:

Product Var Name i5_ir_lid

Is element of: GLA02 Record

Short Description: 1064 nm LIDAR Data from 20 KM to 10 KM

Product Data Type: i4b (132, 5)

Total Bytes: 2640

Product Units: (W*KM^2)/J)*10^8

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -1000000000

Product Maximum: 1000000000

Description: The normalized lidar signal from the 1064 nm cloud digitizer data for the 20 KM to 10 KM atmospheric segment. Background subtraction, and range squared correction is applied.

Comments:

Product Var Name i_CdBg2_Del

Is element of: GLA02 Record

Short Description: Cloud Digitizer Background 2 Delay

Product Data Type: i2b

Total Bytes: 2

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 65535

Description: The delays for background #2 and the range gate from the cloud digitizer board.

Comments:

Product Var Name i_RngGate_Del

Is element of: GLA02 Record

Short Description: Cloud Digitizer Range Gate Delay

Product Data Type: i2b

Total Bytes: 2

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 65535

Description: The delays for background #2 and the range gate from the cloud digitizer board.

Comments:

Product Var Name i_cd_bg1_del
Is element of: GLA02 Record
Short Description: Cloud Digitizer Background 1 Delay
Product Data Type: i2b
Total Bytes: 2
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 65535
Description: The delay for background #1 from the cloud digitizer board.
Comments:

Product Var Name i_cd_det_stat
Is element of: GLA02 Record
Short Description: Cloud Digitizer Detector Status
Product Data Type: i2b
Total Bytes: 2
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 65535
Description: Status of the detector from the cloud digitizer board.
Comments:

Product Var Name i_cd_rbias
Is element of: GLA02 Record
Short Description: Cloud Digitizer Range Bias
Product Data Type: i4b
Total Bytes: 4
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000000
Product Maximum: 1000000
Description: The range bias from the cloud digitizer; always positive.

Comments:

Product Var Name i_cd_ad_out

Is element of: GLA02 Record

Short Description: A/D Output

Product Data Type: i1b

Total Bytes: 1

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: The output from the A/D converter; from the cloud digitizer board. Used for to diagnose problems with the analog path.

Comments:

Product Var Name i_cd_att_set

Is element of: GLA02 Record

Short Description: Attenuation Setting

Product Data Type: i1b

Total Bytes: 1

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: The attentuation setting from the cloud digitizer board.

Comments:

Product Var Name i_CldPkSig

Is element of: GLA02 Record

Short Description: Cloud Return Peak Signal

Product Data Type: i1b (5)

Total Bytes: 5

Product Units: photons / bin

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32

Description: Peak photon count in the 532 nm backscatter data within the range for cloud returns; at the 5 Hz rate.

Comments:

Product Var Name i_gndret_pksig

Is element of: GLA02 Record

Short Description: Ground Return Peak Signal

Product Data Type: i1b (5)

Total Bytes: 5

Product Units: photons / bin

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32

Description: Peak photon count in the 532 nm backscatter data. It is assumed that a ground return causes the maximum signal; at the 5 Hz rate.

Comments:

Product Var Name i_gnd_ret_loc

Is element of: GLA02 Record

Short Description: Ground Return Location

Product Data Type: i1b (5)

Total Bytes: 5

Product Units: bin number

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32

Description: Bin number (from the end of the profile) of the estimated ground return peak signal; at the 5 Hz rate.

Comments:

Product Var Name i_et_cal_mode

Is element of: GLA02 Record

Short Description: Etalon Calibration - Current mode

Product Data Type: i1b

Total Bytes: 1

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 3

Description: Current mode of Etalon calibration: 0 = Off, 1 = Acquire, 2 = Tracking, 3 = Invalid.

Comments:

Product Var Name i_ir_TxNrg_qf

Is element of: GLA02 Record, GLA07 Record

Short Description: 1064 nm Laser Transmit Energy Quality Flag

Product Data Type: i1b (10)

Total Bytes: 10

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 3

Description: Evaluation of the 1064 nm laser transmit energy which is an indication of the laser health; 2 bits per shot for 40 shots; 1 = full laser energy, 2 = marginal laser energy, 3 = deficient laser energy, 0 = not used.

Please see <a href='flags/i_ir_TxNrg_qf.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_EtHtrC37j_c

Is element of: GLA02 Record, GLA03 Main Record

Short Description: Etalon Heater Current, Ch 37j

Product Data Type: i2b

Total Bytes: 2

Product Units: Amps X 100

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2500

Description: Etalon Heater Current, Ch 37j

Comments:

Product Var Name i_EtC37d_t

Is element of: GLA02 Record, GLA03 Main Record

Short Description: Etalon Temperature, Ch 37d

Product Data Type: i2b

Total Bytes: 2

Product Units: Celsius X 100

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -1000

Product Maximum: 3000

Description: Etalon Temperature, Ch 37d

Comments:

Product Var Name i_ETsettleTime

Is element of: GLA02 Record

Short Description: Etalon Temperature Settle Time

Product Data Type: i2b

Total Bytes: 2

Product Units: seconds

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 65535

Description: The commanded time the software will wait after a temperature setpoint is sent to the etalon heater. Integer units in seconds. Applies only to tracking mode.

Comments:

Product Var Name i_et_Flags

Is element of: GLA02 Record

Short Description: Etalon Flags

Product Data Type: i1b

Total Bytes: 1

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: bit 0: Etalon Tracking Low Transmission Flag (= low_tr_on)

  0 = GOOD (on-axis transmission is above limit)

  1 = LOW (on-axis transmission is below limit)

bit 1: Etalon Tracking Active Flag (= track_ok)

0 = PAUSED (tracking is paused)
1 = ACTIVE (tracking is active)

bit 2: Etalon Test Mode Flag

0 = NORMAL (reading data from LMB sensors)
1 = TEST (using test data values)

bit 3: Etalon Nonstandard Tracking Mode Flag

0 = ORIGINAL (original tracking mode)
1 = MODIFIED (open-loop or modified closed-loop mode)

bit 4: Etalon Open-Loop Cycle Update Flag (= ol_updates)

0,1 = toggles each time an open-loop cycle starts
Comments:

Product Var Name i_et_update_ctr
Is element of: GLA02 Record
Short Description: Etalon Averaging Update Counter
Product Data Type: i1b
Total Bytes: 1
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 255
Description: Etalon averaging update counter.
Comments:

Product Var Name i_et_StartTemp
Is element of: GLA02 Record
Short Description: Start Temperature
Product Data Type: i1b
Total Bytes: 1
Product Units: Celsius
Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 255
Description: Start Temperature
Comments:

Product Var Name i_et_StopTemp
Is element of: GLA02 Record
Short Description: Stop Temperature
Product Data Type: i1b
Total Bytes: 1
Product Units: Celsius
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 255
Description: Stop Temperature.
Comments:

Product Var Name i_et_TempStep
Is element of: GLA02 Record
Short Description: Temperature Step
Product Data Type: i1b
Total Bytes: 1
Product Units: Celsius
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 255
Description: Temperature Step
Comments:

Product Var Name i_et_spare
Is element of: GLA02 Record
Short Description: ET Spare
Product Data Type: i1b (3)
Total Bytes: 3

Product Units: NA

Invalid Value/Flag: N/A

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: GLA02 et spare.

Product Var Name i_et_acqavg_tm

Is element of: GLA02 Record

Short Description: Etalon Averaging time for acquire command

Product Data Type: i1b

Total Bytes: 1

Product Units: seconds

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 255

Description: Etalon Averaging Time for Acquire Command.

Comments:

Product Var Name i_spare6

Is element of: GLA02 Record

Short Description: Spare 6

Product Data Type: i1b

Total Bytes: 1

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_et_temperr

Is element of: GLA02 Record

Short Description: Etalon Temperature Error

Product Data Type: i4b

Total Bytes: 4

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: Etalon Temperature Error.

Comments:

Product Var Name i_ET_state

Is element of: GLA02 Record

Short Description: Etalon State

Product Data Type: i1b

Total Bytes: 1

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 3

Description: State of the etalon: 0 = Init, 1 = Set Temp, 2 = Wait, 3 = Average

Comments:

Product Var Name i_spare3

Is element of: GLA02 Record

Short Description: Spare 3

Product Data Type: i1b

Total Bytes: 1

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_et_acqset_tm
Is element of: GLA02 Record
Short Description: Etalon Temperature Settle time for acquire cmd
Product Data Type: i2b
Total Bytes: 2
Product Units: seconds
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32767
Description: Etalon Temperature Settle Time for acquire cmd.
Comments:

Product Var Name i_et_onax_xmit
Is element of: GLA02 Record
Short Description: Etalon Averaged on-axis Transmission
Product Data Type: i4b
Total Bytes: 4
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 2147483647
Description: Etalon Averaged on-axis Transmission.
Comments:

Product Var Name i_et_offax_xmit
Is element of: GLA02 Record
Short Description: Etalon Averaged off-axis Transmission
Product Data Type: i4b
Total Bytes: 4
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 2147483647
Description: Etalon Averaged off-axis Transmission.

Comments:

Product Var Name i_et_trkfltout

Is element of: GLA02 Record

Short Description: Etalon Tracking Loop Filter output

Product Data Type: i4b

Total Bytes: 4

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: Etalon Tracking Loop Filter output.

Comments:

Product Var Name i_et_trkfltavg

Is element of: GLA02 Record

Short Description: Etalon Tracking Failure Average

Product Data Type: i4b

Total Bytes: 4

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: Etalon Tracking Failure Average

Comments:

Product Var Name i_APID_AvFlg

Is element of: GLA01 Main Record, GLA02 Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: APID Data Availability Flag

Product Data Type: i1b (8)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -127

Product Maximum: 127

Description: Flag indicating which packets (APIDs) for each second are available missing, or filled. APID 19 is broken down further into Altimeter Digitizer, Photon Counter, Cloud Digitizer, GPS/DEM, and C&T sections.

Please see the PDF flag description in the next section for more details.

Comments:

Product Var Name i_OrbFlg

Is element of: GLA01 Main Record, GLA02 Record, GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: POD flag (Orbit Flag)

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 128

Description: Denotes quality of orbit, whether predicted or precision, loss of GPS data, maneuver-degraded, etc.

Please see <a href='flags/i_OrbFlg.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_HoffMin

Is element of: GLA02 Record

Short Description: Offset to minimum DEM height

Product Data Type: i2b

Total Bytes: 2

Product Units: meters

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 12000

Description: Offset to minimum DEM height used in flight algorithm

Comments:

Product Var Name i_Hsat

Is element of: GLA02 Record

Short Description: Geodetic altitude of satellite above earth

Product Data Type: i4b

Total Bytes: 4

Product Units: centimeters

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 50000000

Product Maximum: 70000000

Description: Geodetic altitude of satellite above earth's surface computed in real time by the GLAS flight algorithm.

Comments:

Product Var Name i_4nsBgMean

Is element of: GLA02 Record

Short Description: 4ns Background Mean Value

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 65536

Description: 4ns Filter Background mean

Comments:

Product Var Name i_4nsBgSDev

Is element of: GLA02 Record

Short Description: 4ns Background Standard Deviation

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 65536

Description: 4ns filter background standard deviation.

Comments:

Product Var Name i_DualPinA

Is element of: GLA02 Record

Short Description: Dual Pin A data

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: No

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: Dual Pin A data (from APID19, offset 1248)

Comments:

Product Var Name i_DualPinB

Is element of: GLA02 Record

Short Description: Dual Pin B Data

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: No

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: Dual Pin B data from APID19, Offset 1288

Comments:

Product Var Name i_spare4

Is element of: GLA02 Record

Short Description: Spare 4

Product Data Type: i1b

Total Bytes: 1

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_DitheringEnabledFlag

Is element of: GLA02 Record, GLA07 Record

Short Description: Dithering Enabled Flag

Product Data Type: i1b

Total Bytes: 1

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: Yes

Is Unsigned?: NA

Product Minimum: 0

Product Maximum: 1

Description: 0=FALSE, 1=TRUEComments: Not valid if APID15 is missing.

Product Var Name i_timecorflg

Is element of: GLA01 Main Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: time correction flag

Product Data Type: i2b

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: Indicates what instrument or bias corrections were applied to the times on this record. Please see <a href='flags/i_timecorflg.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name spare5

Is element of: GLA02 Record

Short Description: Spare 5

Product Data Type: i1b (12)

Total Bytes: 12

Product Units: n/a

Invalid Value/Flag: N/A

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: n/a

Product Maximum: n/a

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: GLA02 spare5.

Product Var Name i_rec_ndx

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: GLAS Record Index

Product Data Type: i4b

Total Bytes: 4

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: Unique index that relates this record to the corresponding record(s) in each GLAS data product.

Comments:

Product Var Name i_UTCTime

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Transmit Time of First Shot in frame in J2000

Product Data Type: i4b (2)

Total Bytes: 8

Product Units: seconds, microseconds

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: The transmit time of the first shot in the 1 second frame measured as 'UTC seconds' elapsed since Jan 1 2000 12:00:00 UTC. This time has been derived from the GPS time accounting for leap seconds. The first item is the whole number of seconds; the second item is the fractional part in microseconds.

Comments: This is not the ground bounce time, but the transmit time.

Product Var Name i_transtime

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: One way transit time

Product Data Type: i2b

Total Bytes: 2

Product Units: microseconds

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 4000

Description: One way transit time calculated using the preliminary range offset. This is added to the UTC time tag to get the ground bounce times at which to calculate the orbit

Comments:

Product Var Name i_spare1

Is element of: GLA05 record

Short Description: i_spare1

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_deltagpstmcor

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Delta GPS time correction

Product Data Type: i4b

Total Bytes: 4

Product Units: nanoseconds

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -1000000

Product Maximum: 1000000

Description: The high frequency delta GPS time correction calculated during the precision orbit processing step.

Comments:

Product Var Name i_dShotTime

Is element of: GLA01 Main Record, GLA04 LPA Main Record, GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Laser Shot Time Deltas (shots 2-40)

Product Data Type: i4b (39)

Total Bytes: 156

Product Units: microseconds

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1200000

Description: The time deltas of pulses 2 through 40 to i_UTCTime, the UTC time tag of the first pulse in the 1-second data frame. Adding the deltas to i_UTCTime will give the user the time of each individual shot in the frame.

Comments: To calculate the time for shots 2-40, add these deltas to the time of the first shot.

Product Var Name i_lat

Is element of: GLA05 record

Short Description: Spot Coordinate Data - Latitude (Uncorrected)

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: Microdegrees

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -90000000

Product Maximum: 90000000

Description: The geodetic latitude of the forty laser spots in this record, computed from the Precision orbit, precision attitude, and preliminary range. The preliminary range is used with no geodetic corrections applied.

Comments: This latitude may differ from that on GLA06 and the level 2 elevation products where a corrected range is used in the calculation

Product Var Name i_lon

Is element of: GLA05 record

Short Description: Spot Coordinate Data - Longitude (Uncorrected)

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: Microdegrees

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 360000000

Description: The longitude of the forty laser spots in this record, computed from the Precision orbit, precision attitude, and preliminary range. The preliminary range is used with no geodetic corrections applied.

Comments: This longitude may differ from that on GLA06 and the level 2 products where a corrected range is used in the calculation

Product Var Name i_elev

Is element of: GLA05 record

Short Description: Spot Surface Elevation with respect to ITRF ellipsoid (Uncorrected)

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -3300000

Product Maximum: 9000000

Description: The surface elevation with respect to ellipsoid of the forty laser spots in this record. The elevation is calculated using the preliminary range, the precision orbit, and precision attitude with no geodetic corrections applied.

Comments: This will differ from the elevation on the elevation products where it is calculated from the range corrected for geodetic affects and measured to a region-type dependent specific location on the received waveform.

Product Var Name i_spare43

Is element of: GLA05 record

Short Description: Spare 43

Product Data Type: i4b (12, 40)

Total Bytes: 1920

Product Units: NA

Invalid Value/Flag: NA

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: NA

Product Maximum: NA

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: GLA05 Spare43

Product Var Name i_sigmaatt

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Attitude Quality Indicator

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: Unitless

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 6000

Description: Attitude quality indicator. Values: 0=good; 50=warning; 100=bad.

Comments: This indicator currently has only 3 values: 0, 50, and 100, leaving open the opportunity to use numbers in between for further resolution of the degradation as our knowledge improves.

Product Var Name i_gval_rcv

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Gain Value used for Received Pulse

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: counts

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 255

Description: Gain value used for received pulse - uncalibrated.

Comments: This value is in counts and needs to be calibrated before calculating energy from it. Same as variable in GLA01_Long/i_gainSet1064.

Product Var Name i_wfnoiseOb1

Is element of: GLA05 record

Short Description: 1064 nm Background noise, (alternate)

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: 0.0001 volts

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -300

Product Maximum: 30000

Description: Either the background noise mean value measured by the instrument, or the background noise calculated from the received echo using alternative parameters. See local flag definition for l_WFqual - a flag is set if the background noise is calculated.

Comments:

Product Var Name i_wfnoiseOb2

Is element of: GLA05 record

Short Description: 1064 nm Background noise, (standard)

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: 0.0001 volts

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -300

Product Maximum: 30000

Description: Either the background noise mean value measured by the instrument, or the background noise calculated from the received echo using standard parameters. See local flag definition for l_WFqual - a flag is set if the background noise is calculated.

Comments:

Product Var Name i_sDevNsOb1

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Standard deviation of 1064 nm Background noise, (alternate)

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: 0.0001 volts

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 30000

Description: The standard deviation of the background noise (alternative parameters).

Comments: Can be used for computing signal-to-noise ratio along with unsmoothed max amplitude.

Product Var Name i_sDevNsOb2

Is element of: GLA05 record

Short Description: Standard deviation of 1064 nm Background noise, (standard)

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: 0.0001 volts

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 30000

Description: The standard deviation of the background noise (standard parameters).

Comments:

Product Var Name i_refRngNs

Is element of: GLA05 record

Short Description: Reference Range

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: .01 ns

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 400000000

Product Maximum: 1000000000

Description: Two-way Reference range in time measured from the centroid of the transmit pulse to the last received echo digitizer gate telemetered (farthest from the spacecraft).

Comments: This is not the range measurement, but a reference value from which the offsets to calculate the range measurement are given. The range measurement will be to a specific location on the received echo that represents the surface response.

Product Var Name i_thRtkRngOff1

Is element of: GLA05 record

Short Description: Threshold Retracker Range Offset (alternative)

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: 0.01 ns

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100000

Product Maximum: 0

Description: Offset to be added to i_refRng to give the two-way range in time to the threshold retracker location on the received echo calculated using alternative parameters.

Comments: The position on the received echo for threshold retracking is calculated as the first received gate where the voltage is > n*sigma (see ATBD). This is calculated after converting the noise and waveform from counts to voltage.

Product Var Name i_thRtkRngOff2

Is element of: GLA05 record

Short Description: Threshold Retracker Range Offset (standard)

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: 0.01 ns

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100000

Product Maximum: 0

Description: Offset to be added to i_refRng to give the two-way range in time to the threshold retracker location on the received echo using standard parameters.

Comments: The position on the received echo for threshold retracking is calculated as the first received gate where the voltage is > n*sigma (see ATBD). This is calculated after converting the noise and waveform from counts to voltage.

Product Var Name i_minRngOff1

Is element of: GLA05 record

Short Description: Minimum Range Offset (alternative)

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: 0.01 ns

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100000

Product Maximum: 0

Description: Offset to be added to i_refRng to give the two-way range in time to the location on the received echo calculated as the beginning of signal (closest to the spacecraft) using alternate parameters.

Comments: This is calculated after the received echo and noise values are calibrated and converted from counts to voltage as the first received gate where the voltage is > n*sigma (see ATBD). The value of n may be different than threshold retracker.

Product Var Name i_minRngOff2

Is element of: GLA05 record

Short Description: Minimum Range Offset (standard)

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: 0.01 ns

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100000

Product Maximum: 0

Description: Offset to be added to i_refRng to give the two-way range in time to the location on the received echo calculated as the beginning of signal (closest to the spacecraft) closest to the spacecraft using standard parameters.

Comments: This is calculated after the received echo and noise values are calibrated and converted from counts to voltage as the first received gate where the voltage is > n*sigma (see ATBD). The value of n may be different than threshold retracker.

Product Var Name i_preRngOff1

Is element of: GLA05 record

Short Description: Preliminary Uncorrected Range Offset (alternative)

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: 0.01 ns

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100000

Product Maximum: 0

Description: Offset to be added to i_refRng to give the two-way range in time to the location on the received echo calculated as the end of signal (farthest from the spacecraft) using alternative parameters.

Comments: This is calculated after the received echo and noise values are calibrated and converted from counts to voltage (see ATBD).

Product Var Name i_preRngOff2

Is element of: GLA05 record

Short Description: Preliminary Uncorrected Range Offset (standard)

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: 0.01 ns

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100000

Product Maximum: 0

Description: Offset to be added to i_refRng to give the two-way range in time to the location on the received echo calculated as the end of signal (farthest from the spacecraft) using standard parameters.

Comments: This is calculated after the received echo and noise values are calibrated and converted from counts to voltage (see ATBD). This is the range used to calculate the geodetic coordinates of the footprint and elevations on this record.

Product Var Name i_centroid1

Is element of: GLA05 record

Short Description: Centroid retracker offset (alternative)

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: 0.01 ns

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100000

Product Maximum: 0

Description: Offset to be added to i_refRng to give the two-way range in time to the location of the centroid of the received echo from signal begin through signal end defined by the alternative parameters.

Comments: This is calculated after the received echo and noise values are calibrated and converted from counts to voltage (see ATBD).

Product Var Name i_centroid2

Is element of: GLA05 record

Short Description: Centroid retracker offset (standard)

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: 0.01 ns

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100000

Product Maximum: 0

Description: Offset to be added to i_refRng to give the two-way range in time to the location of the centroid of the received echo from signal begin through signal end defined by the standard parameters.

Comments: This is calculated after the received echo and noise values are calibrated and converted from counts to voltage (see ATBD).

Product Var Name i_centroidInstr

Is element of: GLA05 record

Short Description: Centroid retracker offset using max peak

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: 0.01 ns

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100000

Product Maximum: 0

Description: Offset to be added to i_refRng to give the two-way range in time to the location on the received echo of the centroid of the signal surrounding the maximum amplitude peak.

Comments: This is the definition used by the instrument team to check out the on-board algorithms. See ATBD

Product Var Name i_areaRecWF1
Is element of: GLA05 record
Short Description: Area under received echo (alternative)
Product Data Type: i2b (40)
Total Bytes: 80
Product Units: 0.01 volts * ns
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 32766
Description: Area under the received echo from signal begin to signal end using alternative parameters.
Comments: This is calculated after converting the return to voltage.

Product Var Name i_areaRecWF2
Is element of: GLA05 record
Short Description: Area under received echo (standard)
Product Data Type: i2b (40)
Total Bytes: 80
Product Units: 0.01 volts * ns
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 32766
Description: Area under the received echo from signal begin to signal end using standard parameters.
Comments: This is calculated after converting the return to voltage.

Product Var Name i_maxRecAmp
Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: Max Amplitude of Received Echo
Product Data Type: i2b (40)
Total Bytes: 80
Product Units: Tenth of millivolts
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -300

Product Maximum: 30000

Description: Maximum Amplitude of the Received Echo.

Comments: This is calculated after converting the return to voltage. Use for scaling model fit RMS between normalized and un-normalized units.

Product Var Name i_maxSmAmp

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Peak Amplitude of Smoothed Received Echo

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: Tenth of millivolts

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -300

Product Maximum: 30000

Description: The peak amplitude of the received echo after it has been smoothed to remove high frequency noise (see ATBD).

Comments: This is calculated after converting the return to voltage.

Product Var Name i_reflctUncorr

Is element of: GLA05 record

Short Description: Reflectivity not corrected for Atmospheric Effects

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: Unitless*1E06

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1000000

Description: Reflectivity, not corrected for atmospheric effects, is calculated as Refl = R/T, where R is the received energy after it has been scaled for range, and T is the transmitted energy. i_reflctUncorr has also been calibrated for gain non-linearity (only for non-saturated waveforms), ground truth calibration and boresight shift shadowing (BSS). It is not corrected for saturation effects. If the shot is saturated (satindex above 2) then to correct for saturation the reflectivity estimate needs to be multiplied by the ratio of the corrected energy to the uncorrected energy (sat corrected reflectivity = i_reflctUncorr * (i_RecNrgAll + i_satNrgCorr)/i_RecNrgAll)

The atmospheric corrected reflectivity may be calculated from this uncorrected reflectivity by multiplying it by d_reflCor_atm.

GLA06%i_reflctUC is the same as i_reflctUncorr, except that it is invalid when

GLA06%d_satNrgCorr is invalid.

Comments: This uses all signal between signal begin and signal end.

Product Var Name i_reflctuncmxpk

Is element of: GLA05 record

Short Description: Reflectivity Not Corrected For Atmospheric Effects from max peak

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: unitless x1.E06

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1000000

Description: Reflectivity, not corrected for atmospheric effects from max peak, is calculated as Refl = R/T, where R is the received energy from the maximum amplitude peak of the waveform after it has been scaled for range, and T is the transmitted energy. i_reflctuncmxpk has also been calibrated for gain non-linearity (only for non-saturated waveforms), ground truth calibration and boresight shift shadowing (BSS). It is not corrected for saturation effects. If the shot is saturated (satindex above 2) then to correct for saturation the reflectivity estimate needs to be multiplied by the ratio of the corrected energy to the uncorrected energy (sat corrected reflectivity = i_reflctuncmxpk * (i_RecNrgAll + i_satNrgCorr)/i_RecNrgAll)

The atmospheric corrected reflectivity may be calculated from this uncorrected reflectivity by multiplying it by d_reflCor_atm.

Comments: This uses only the signal surrounding the maximum peak.

Product Var Name i_tpCentX

Is element of: GLA05 record

Short Description: LPA Centroid X

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: arcsec*10

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32766

Description: X position of the centroid of the transmit pulse in the LPA, in arcsec from the left edge of the LPA (outer edge of pixel column 0). From ANC09.

Comments:

Product Var Name i_tpCentY

Is element of: GLA05 record

Short Description: LPA Centroid Y

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: arcsec*10

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32766

Description: Y position of the centroid of the transmit pulse in the LPA, in arcsec from the upper edge of the LPA (outer edge of pixel row 0). From ANC09.

Comments:

Product Var Name i_nPeaks1

Is element of: GLA05 record, GLA06 record, GLA14 Record

Short Description: Initial Number of Peaks in received echo (alternate)

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 50

Description: The initial number of peaks of the received echo; determined from the smoothed waveform, using alternative parameters

Comments:

Product Var Name i_nPeaks2

Is element of: GLA05 record

Short Description: Initial Number of Peaks in received echo (standard)

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 50

Description: The initial number of peaks found in the received echo; determined from the smoothed waveform, using standard parameters

Comments:

Product Var Name i_parm1

Is element of: GLA05 record

Short Description: Parameters from the Gaussian fit to the received echo (alternative)

Product Data Type: i4b (19, 40)

Total Bytes: 3040

Product Units: 0.0001 volts, 6 * (0.0001 volts, 0.01 ns, 0.01 ns)

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -30, 6 * (0, -100000, 0)

Product Maximum: 30000, 6 * (30000, 0, 32766)

Description: Parameters (in physical units) determined from the fit of the received echo using the alternative parameterization. In the order of: item1=noise (millivolts), then 6 sets of three Gaussian parameters (subitem1=amplitude (millivolts), subitem2=peak location (ns), and subitem3=sigma (ns)). Items 2-4 are the Gaussian parameters for the last (closest-to-the-ground or 1st) peak. Items 5-7 are the Gaussian parameters for the next-to-last (2nd) peak. Items 17-19 are the Gaussian parameters for the closest-to-the-satellite peak. If there are fewer than six peaks, the unused parameters are set invalid. Adding the location to i_refRng gives the two-way range in time to the center of that peak.

Comments: The received echo was calibrated and converted from counts to voltage using table in header records before the fit was performed.

Product Var Name i_parm2

Is element of: GLA05 record

Short Description: Parameters from Gaussian fit to the received echo (standard)

Product Data Type: i4b (19, 40)

Total Bytes: 3040

Product Units: 0.0001 volts, 6 * (0.0001 volts, 0.01 ns, 0.01 ns)

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -30, 6 * (0, -100000, 0)

Product Maximum: 30000, 6 * (30000, 0, 32766)

Description: Parameters (in physical units) determined from the fit of the received echo using the standard parameterization. In the order of: item1=noise (millivolts), then 6 sets of Gaussian parameters (subitem1=amplitude (millivolts), subitem2=peak location (ns), and subitem3=sigma (ns)). Items 2-4 are the Gaussian parameters for the last (closest-to-the-ground or 1st) peak. Items 5-7 are the Gaussian parameters for the next-to-last (2nd) peak. Items 17-19 are the Gaussian parameters for the closest-to-the-satellite peak. If there are fewer than six peaks, the unused parameters are set invalid. Adding the location to i_refRng gives the two-way range in time to the center of that peak.

Comments: The received echo was calibrated and converted from counts to voltage using table in header records before the fit was performed.

Product Var Name i_solnSigmas1

Is element of: GLA05 record

Short Description: Sigmas of fit parameters (alternative)

Product Data Type: i2b (19, 40)

Total Bytes: 1520

Product Units: 0.0001 volts, 6 * (0.0001 volts, 0.001 ns, 0.001 ns)

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 30000, 6 * (30000, 3000, 3000)

Description: Standard deviation of each fit parameter from diagonal of final covariance matrix from alternative parameterization. In the order of: item1=noise (millivolts), then 6 sets of three parameters (subitem1=amplitude (millivolts), subitem2=peak location (ns), and subitem3=sigma (ns)). Items 2-4 are the parameters for the last (closest-to-the-ground or 1st) peak. Items 5-7 are the parameters for the next-to-last (2nd) peak. Items 17-19 are the parameters for the closest-to-the-satellite peak. If there are fewer than six peaks, the unused parameters are set invalid.

Comments: Note that the received echo was calibrated and converted from counts to voltage using table in header records before the fit was performed.

Product Var Name i_solnSigmas2

Is element of: GLA05 record

Short Description: Sigmas of fit parameters (standard)

Product Data Type: i2b (19, 40)

Total Bytes: 1520

Product Units: 0.0001 volts, 6 * (0.0001 volts, 0.001 ns, 0.001 ns)

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 30000, 6 * (30000, 3000, 3000)

Description: Standard deviation of each fit parameter from diagonal of final covariance matrix from standard parameterization. In the order of: item1=noise (millivolts), then 6 sets of three parameters (subitem1=amplitude (millivolts), subitem2=peak location (ns), and subitem3=sigma (ns)). Items 2-4 are the parameters for the last (closest-to-the-ground or 1st) peak. Items 5-7 are the parameters for the next-to-last (2nd) peak. Items 17-19 are the parameters for the closest-to-the-satellite peak. If there are fewer than six peaks, the unused parameters are set invalid.

Comments: Note that the received echo was calibrated and converted from counts to voltage using table in header records before the fit was performed.

Product Var Name i_wfFitSDev_1

Is element of: GLA05 record

Short Description: The received echo fit standard deviation (alternative)

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: unitless

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 30000

Description: The standard deviation of the difference between the functional fit and the received echo using alternative parameters.

Comments: Note that the received echo was calibrated and converted from counts to voltage using table in header records before the fit was performed.

Product Var Name i_wfFitSDev_2

Is element of: GLA05 record

Short Description: The received echo fit standard deviation (standard)

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: microvolts*10

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 30000

Description: The standard deviation of the difference between the functional fit and the received echo using the standard parameters

Comments: Note that the received echo was calibrated and converted from counts to voltage using table in header records before the fit was performed.

Product Var Name i_tpintensity

Is element of: GLA05 record

Short Description: Transmit pulse intensity

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: counts

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 25500

Description: Transmit pulse intensity as measured by the LPA. From ANC09.

Comments:

Product Var Name i_tpazimuth

Is element of: GLA05 record

Short Description: Transmit pulse azimuth

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: deg*10

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 3600

Description: Transmit pulse azimuth. Angle eastwards from north of the major axis of the transmit pulse, as seen by the LPA. From ANC09.

Comments:

Product Var Name i_tpeccentricity

Is element of: GLA05 record

Short Description: Transmit pulse eccentricity

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: e*1000

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1000

Description: Transmit pulse eccentricity as measured by the LPA. From ANC09.

Comments:

Product Var Name i_tpmajoraxis

Is element of: GLA05 record

Short Description: Transmit pulse major axis

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: cm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 10000

Description: Transmit pulse major axis as measured by the LPA. From ANC09.

Comments:

Product Var Name i_skew1
Is element of: GLA05 record, GLA14 Record
Short Description: Skewness of Received Echo (alternative)
Product Data Type: i2b (40)
Total Bytes: 80
Product Units: unitless * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -10000
Product Maximum: 10000
Description: Skewness of the received echo from signal begin to signal end using alternative parameters
Comments: Note that the received echo was calibrated and converted to voltage before calculation.

Product Var Name i_kurt1
Is element of: GLA05 record, GLA14 Record
Short Description: Kurtosis of Received Echo (alternative)
Product Data Type: i2b (40)
Total Bytes: 80
Product Units: unitless * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000
Product Maximum: 1000
Description: Kurtosis of the received echo from signal begin to signal end using alternative parameters
Comments: Note that the received echo was calibrated and converted to voltage before calculation.

Product Var Name i_skew2
Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA15 Record
Short Description: Skewness
Product Data Type: i2b (40)
Total Bytes: 80
Product Units: unitless * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -10000
Product Maximum: 10000
Description: The skewness of the received echo from signal begin to signal end using standard parameters.

Comments: Note that the received echo was calibrated and converted to voltage before calculation.

Product Var Name i_kurt2

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA15 Record

Short Description: Kurtosis of the Received Echo (standard)

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: unitless * 100

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -1000

Product Maximum: 1000

Description: Kurtosis of the received echo from signal begin to signal end using standard parameters

Comments: Note that the received echo was calibrated and converted to voltage before calculation.

Product Var Name i_WFqual

Is element of: GLA05 record

Short Description: Received Echo Quality Flag

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: Indicator of the quality of the received echo (waveform); determined during the received echo assessment process, and the functional fit. Each 4 byte integer represents 32 bits of flag information. For definitions of each bit,

Please see <a href='flags/i_WFqual.pdf'> the PDF flag description in the next section.

Comments:

Product Var Name i_TxNrg

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: 1064 nm Laser Transmit Energy

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: 0.01 millijoules

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32766

Description: The 1064 nm laser pulse transmitted energy in energy units, computed from the digitized outgoing pulse, and the transmit gain.

Comments:

Product Var Name i_tpOrX

Is element of: GLA05 record

Short Description: Pulse Orientation

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: degrees*10

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 3600

Description: Pulse Orientation (Angle measured counter-clockwise from LPA X-axis)

Comments:

Product Var Name i_locTr

Is element of: GLA05 record

Short Description: Centroid of Transmitted Pulse in time relative to gate 1 of tr wf

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: 0.01 ns

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 4800

Description: Time from gate 1 of the transmitted pulse to the centroid of transmitted pulse calculated from 48 gates telemetered

Comments: Note that the pulse was calibrated and converted to voltage before calculation.

Product Var Name i_parmTr

Is element of: GLA05 record

Short Description: Parameters of the Gaussian fit to the Transmitted Pulse

Product Data Type: i4b (4, 40)

Total Bytes: 640

Product Units: microvolts*100, microvolts*100, 0.01 ns, 0.01 ns

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -30, -30, 0, 0

Product Maximum: 30000, 30000, 4800, 32766

Description: Parameters from the Gaussian fit to the transmitted pulse: item1=noise (millivolts), item2=amplitude (millivolts), Item3=peak location (ns), and item 4=sigma (ns). Peak location is relative to gate 1 of the transmit pulse.

Comments: Note that the pulse was calibrated and converted to voltage before calculation.

Product Var Name i_sDevFitTr

Is element of: GLA05 record

Short Description: Standard deviation of fit of transmitted pulse

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: microvolts*10

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 30000

Description: Standard deviation of fit of a gaussian model to the transmitted pulse

Comments: Note that the pulse was calibrated and converted to voltage before calculation.

Product Var Name i_skewTr

Is element of: GLA05 record

Short Description: Skewness of Transmitted Pulse

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: NA

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -1000

Product Maximum: 1000

Description: Skewness of transmitted pulse

Comments: Note that the pulse was calibrated and converted to voltage before calculation.

Product Var Name i_maxTrAmp

Is element of: GLA05 record

Short Description: Maximum Amp of Transmitted Pulse

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: 0.1 millivolts

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -300

Product Maximum: 30000

Description: Maximum amplitude of transmitted pulse calculated from all (48) gates telemetered

Comments: Note that the pulse was calibrated and converted to voltage before calculation.

Product Var Name i_gval_tx

Is element of: GLA05 record

Short Description: Gain Value used for Transmitted Pulse - uncalibrated

Product Data Type: i2b

Total Bytes: 2

Product Units: counts

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 255

Description: Gain value used for transmitted pulse - uncalibrated

Comments: This value is in counts and needs to be calibrated before calculating energy from it. Same as variable in GLA01_Main/i_ADdetOutGn.

Product Var Name i_compRatio

Is element of: GLA01 Main Record, GLA05 record

Short Description: Compression Ratios

Product Data Type: i2b (2)

Total Bytes: 4

Product Units: unitless

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 1

Product Maximum: 5

Description: Averaging values p and q for frame. First item is p; second is q. From APID19, Offset 232. First N downlink samples are generated by averaging p raw digitized elements and the rest of the allocated samples in the waveform by averaging q elements.

Comments: Not valid if APID19 is missing.

Product Var Name i_N_val

Is element of: GLA01 Main Record, GLA05 record

Short Description: Value of N

Product Data Type: i2b

Total Bytes: 2

Product Units: gates

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 544

Description: Value of N used for waveform compression for the frame. From APID19, Offset 236.

Comments: Not valid if APID19 is missing.

Product Var Name i_r_val

Is element of: GLA01 Main Record, GLA05 record

Short Description: Value of r

Product Data Type: i2b

Total Bytes: 2

Product Units: unitless

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 8

Description: Value of r used for waveform compression for frame. From APID19, Offset 238. Not valid if APID19 is missing.

Comments: After M shots with no valid return, the 'p' and 'q' averaging of the normal downlinked waveform compression type will be overridden and instead the telemetered received echo will consist of average samples averaged over 'r' raw samples.

Product Var Name i_ElvuseFlg

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Elevation use flag

Product Data Type: i1b (5)

Total Bytes: 5

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -127

Product Maximum: 127

Description: Flag indicating whether the elevations on this record should be used or not (1 bit set/shot). See the <a href='flags/i_ElvuseFlg.pdf'>PDF file</A> for more information.

Comments:

Product Var Name i_spare3

Is element of: GLA05 record

Short Description: Spare 3

Product Data Type: i1b

Total Bytes: 1

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_ElvFlg

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Elevation Definition Flag

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 127

Description: Indicates how location on the received echo was determined to calculate the elevation on the record.

Please see <a href='flags/i_ElvFlg.pdf'> the PDF flag description in the next section for more details. 'For GLA05, 06 and 12,13,14 and 15, bits are set to reflect the range offset used for that products elevation. Although defined as a pass-thru, the values are different on GLA06/12,13,15 and GLA14.'

Comments:

Product Var Name i_spare49

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Spare 49

Product Data Type: i1b (10)

Total Bytes: 10

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_timecorflg

Is element of: GLA01 Main Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: time correction flag

Product Data Type: i2b

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: Indicates what instrument or bias corrections were applied to the times on this record. Please see <a href='flags/i_timecorflg.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_APID_AvFlg

Is element of: GLA01 Main Record, GLA02 Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: APID Data Availability Flag

Product Data Type: i1b (8)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -127

Product Maximum: 127

Description: Flag indicating which packets (APIDs) for each second are available missing, or filled. APID 19 is broken down further into Altimeter Digitizer, Photon Counter, Cloud Digitizer, GPS/DEM, and C&T sections.

Please see the PDF flag description in the next section for more details.

Comments:

Product Var Name i_AttFlg2

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Attitude Flag 2

Product Data Type: i1b (20)

Total Bytes: 20

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 15

Description: Denotes at 40/sec rate whether precision attitude was used to determine spot location, and if problems with LPA, etc.

Please see <a href='flags/i_AttFlg2.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_spare4

Is element of: GLA05 record

Short Description: Spare 4

Product Data Type: i1b

Total Bytes: 1

Product Units: NA

Invalid Value/Flag: N/A

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_FrameQF

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Altimeter Frame Quality Flag

Product Data Type: i1b

Total Bytes: 1

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1

Description: Denotes all bad data (no signal in whole frame), or all data good and all science team recommended corrections applied

Please see <a href='flags/i_FrameQF.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_OrbFlg

Is element of: GLA01 Main Record, GLA02 Record, GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: POD flag (Orbit Flag)

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 128

Description: Denotes quality of orbit, whether predicted or precision, loss of GPS data, maneuver-degraded, etc.

Please see <a href='flags/i_OrbFlg.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_rngCorrFlg

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Range Correction Flag

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: Denotes which geophysical or instrument corrections have been applied to the range in the calculation of the elevation on this record.

Please see <a href='flags/i_rngCorrFlg.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_spare5

Is element of: GLA05 record

Short Description: Spare 5

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: NA

Invalid Value/Flag: N/A

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: NA

Product Maximum: NA

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_beam_coelev

Is element of: GLA05 record, GLA07 Record

Short Description: Co-elevation

Product Data Type: i4b

Total Bytes: 4

Product Units: degrees*100

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 36000

Description: Co-elevation (CE) is direction from vertical of the laser beam as seen by an observer located at the laser ground spot.

Comments:

Product Var Name i_beam_azimuth

Is element of: GLA05 record, GLA07 Record

Short Description: Azimuth

Product Data Type: i4b

Total Bytes: 4

Product Units: degrees*100

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 36000

Description: The direction, eastwards from north, of the laser beam vector as seen by an observer at the laser ground spot viewing toward the spacecraft (i.e., the vector from the ground to the spacecraft). When the spacecraft is precisely at the geodetic zenith, the value will be 99999 degrees.

Comments:

Product Var Name i_AttFlg1

Is element of: GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Attitude Flag 1

Product Data Type: i2b

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: At 1/sec denotes large off-nadir angle, ocn sweep, target of opportunity, steering to reference track.

Please see <a href='flags/i_AttFlg1.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_RMSpulseWd

Is element of: GLA05 record

Short Description: RMS Pulse Width

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: 100 ns

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1000

Description: The RMS width of the entire received waveform. See Eq 5 of ATBD for Derivation of Range.

Comments:

Product Var Name i_satNdx

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Saturation Index

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: ns

Invalid Value/Flag: gi_invalid_i1b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 126

Description: The count of the number of gates in a waveform which have an amplitude greater than or equal to i_satNdxTh (set in anc07_0004). The value 126 means 126 or more gates are above the saturation index threshold (i_satNdxth).

Comments:

Product Var Name i_RecNrgAll

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Received Energy signal begin to signal end

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: 0.01 fJoules

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32000

Description: This is a pass through of gla01%d_recNrgAll_EU, but stored in different units on the product. This is calculated by taking the area under the received waveform (referenced to the observed noise) from all responses between the noise crossing before the first threshold crossing and the noise crossing after the last threshold crossing. It is a rescaled value of GLA01 parameter d_recNrgAll_EU and is not recomputed.

Comments:

Product Var Name i_numIters

Is element of: GLA05 record

Short Description: Number of iterations performed during fit

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: NA

Product Minimum: 0

Product Maximum: 15

Description: The algorithm variable gla05%i_numIters(40,2) contains the number of iterations for both the standard fit (shot,2), and the alternate fit (shot,1). These numbers are packed into forty bytes on the product:

GLA05_prod%i_numIters(1) contains:

bits 0-3: number of iterations for alternate fit for shot 1,

bits 4-7: number of iterations for standard fit for shot 1

GLA05_prod%i_numIters(2) contains:

bits 0-3: number of iterations for alternate fit for shot 2,

bits 4-7: number of iterations for standard fit for shot 2

GLA05_prod%i_numIters(40) contains:

bits 0-3: number of iterations for alternate fit for shot 40,

bits 4-7: number of iterations for standard fit for shot 40

Comments:

Product Var Name i_spare6

Is element of: GLA05 record

Short Description: Spare 6

Product Data Type: i1b (70)

Total Bytes: 70

Product Units: NA

Invalid Value/Flag: N/A

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: NA

Product Maximum: NA

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_rec_ndx

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: GLAS Record Index

Product Data Type: i4b

Total Bytes: 4

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: Unique index that relates this record to the corresponding record(s) in each GLAS data product.

Comments:

Product Var Name i_UTCTime

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Transmit Time of First Shot in frame in J2000

Product Data Type: i4b (2)

Total Bytes: 8

Product Units: seconds, microseconds

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: The transmit time of the first shot in the 1 second frame measured as 'UTC seconds' elapsed since Jan 1 2000 12:00:00 UTC. This time has been derived from the GPS time accounting for leap seconds. The first item is the whole number of seconds; the second item is the fractional part in microseconds.

Comments: This is not the ground bounce time, but the transmit time.

Product Var Name i_transtime

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: One way transit time

Product Data Type: i2b

Total Bytes: 2

Product Units: microseconds

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 4000

Description: One way transit time calculated using the preliminary range offset. This is added to the UTC time tag to get the ground bounce times at which to calculate the orbit

Comments:

Product Var Name i_Spare1

Is element of: GLA06 record

Short Description: Spare 1

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: N/A

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: GLA06 spare1.

Product Var Name i_deltagpstmcor

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Delta GPS time correction

Product Data Type: i4b

Total Bytes: 4

Product Units: nanoseconds

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -1000000

Product Maximum: 1000000

Description: The high frequency delta GPS time correction calculated during the precision orbit processing step.

Comments:

Product Var Name i_dShotTime

Is element of: GLA01 Main Record, GLA04 LPA Main Record, GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Laser Shot Time Deltas (shots 2-40)

Product Data Type: i4b (39)

Total Bytes: 156

Product Units: microseconds

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1200000

Description: The time deltas of pulses 2 through 40 to i_UTCTime, the UTC time tag of the first pulse in the 1-second data frame. Adding the deltas to i_UTCTime will give the user the time of each individual shot in the frame.

Comments: To calculate the time for shots 2-40, add these deltas to the time of the first shot.

Product Var Name i_lat

Is element of: GLA06 record

Short Description: Spot 1 Coordinate Data, Latitude Corrected

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: microdeg

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -90000000

Product Maximum: 90000000

Description: The geodetic latitude of the 40 laser spots in the 1 second time frame, computed from the Precision orbit, precision attitude, and ice-sheet specific range after instrument corrections, atmospheric delays and tides have been applied. The values are in degrees North.

Comments:

Product Var Name i_lon

Is element of: GLA06 record

Short Description: Spot 1 Coordinate Data, Longitude Corrected

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: microdeg

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 360000000

Description: The longitude of the 40 laser spots in the 1 second time frame, computed from the Precision orbit, precision attitude, and ice-sheet specific range after instrument corrections, atmospheric delays and tides have been applied. The values are in east longitude.

Comments:

Product Var Name i_elev

Is element of: GLA06 record

Short Description: Surface Elevation

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -500000

Product Maximum: 10000000

Description: Surface elevation with respect to the ellipsoid at the spot location determined by the ice-sheet specific range after instrument corrections, atmospheric delays and tides have been applied. The saturation elevation correction (i_satElevCorr) has not been applied and needs to be added to this elevation. This can be over a one meter correction. If it is invalid then the elevation should not be used. The saturation correction flag (i_satCorrFlg) is an important flag to understand the possible quality of the elevation data. The saturation index (i_satNdx) can be used for more understanding of concerns on data quality from saturation effects. Also no correction for pulse spreading from forward scatter has been applied.

Comments:

Product Var Name i_campaign

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Campaign

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: INT(ICHAR(1A))

Product Maximum: INT(ICHAR(3K))

Description: The campaign. ie: for campaign L1A, it will be '1A'.

Comments:

Product Var Name i_spare40

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Spare 40

Product Data Type: i2b

Total Bytes: 2

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: n/a

Product Maximum: n/a

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: Spare 40.

Product Var Name i_cycTrk

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Cycle and Track

Product Data Type: i4b

Total Bytes: 4

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 10001

Product Maximum: 9991354

Description: The track and cycle. On the product, they will be stored as one number: ccctttt.

Comments:

Product Var Name i_localSolarTime

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Local apparent solar time

Product Data Type: i4b

Total Bytes: 4

Product Units: seconds*1000

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 86400000

Description: Local apparent solar time.

Comments:

Product Var Name i_spare41

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Spare 41

Product Data Type: i4b (7)

Total Bytes: 28

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: n/a

Product Maximum: n/a

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.Comments: Spare 41.

Product Var Name i_deltaEllip

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Delta Ellipsoid

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: mm

Invalid Value/Flag: n/a

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -9000

Product Maximum: 9000

Description: Surface Elevation (T/P ellipsoid) minus Surface Elevation(WGS84 ellipsoid).

Comments:

Product Var Name i_beamCoelv

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Co-elevation

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: degrees*100

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 36000

Description: Co-elevation (CE) is direction from vertical of the laser beam as seen by an observer located at the laser ground spot. 40Hz.

Comments:

Product Var Name i_beamAzimuth

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Azimuth

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: degrees*100

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 36000

Description: The direction, eastwards from north, of the laser beam vector as seen by an observer at the laser ground spot viewing toward the spacecraft (i.e., the vector from the ground to the spacecraft). When the spacecraft is precisely at the geodetic zenith, the value will be 99999 degrees. 40 Hz.

Comments:

Product Var Name i_d2refTrk

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Distance to the reference ground track

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: m*1000

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1000000000

Description: Distance to the reference ground track.

Comments:

Product Var Name i_SigBegOff

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA15 Record

Short Description: Signal Begin Range Offset

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -150000

Product Maximum: 0

Description: Offset to be added to i_refRng to give the range in distance to the location on the received echo calculated as the beginning of signal (closest to the spacecraft) using standard parameters.

Comments:

Product Var Name i_DEM_hires_src

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record

Short Description: High Resolution Source Flag

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 128

Description: Flag to specify who the source provider was for the high resolution DEM.

0 = no high res source available

1 = unfinished research Shuttle Radar Topography Mission (SRTM)

        C-band 90 m DEM produced by JPL (+-1.1km E-W swath)

2 = finished SRTM C-band 90 m DEM produced by NGA (+-2.1km E-W swath)

3 = ICESat Greenland V1 1km DEM

4 = ICESat Antarctica V1 500m DEM

5 = 90m Canadian Digital Elevation Data (CDED)

6 = 90m Canadian Digital Elevation Data (CDED) if available otherwise finished SRTM C-band 90 m DEM

Comments: DEM elevations are referenced to the TOPEX/Poseidon ellipsoid and are directly comparable to the elevation on the GLAS products.

Product Var Name i_DEMhiresArElv

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record

Short Description: DEMhiresArElv

Product Data Type: i2b (9, 40)

Total Bytes: 720

Product Units: meters

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -500

Product Maximum: 1300

Description: d_DEMhiresArElv is a 3 X 3 X 40 array of high resolution DEM values. The 1-40 index corresponds to 1/40 second samples. The 1-9 index corresponds to the position of the DEM value relative to the spot. Given the first 1/40 second of data, positional correspondence of the DEM element to the spot is as follows:

The 9 points on the product correspond to the 3x3 points in the alg variable as follows:

gla06%d_DEMhiresArElv(1,1,k) = gla06_prod%i_DEMhiresArElv(1,k) NW

gla06%d_DEMhiresArElv(2,1,k) = gla06_prod%i_DEMhiresArElv(2,k) N

gla06%d_DEMhiresArElv(3,1,k) = gla06_prod%i_DEMhiresArElv(3,k) NE

gla06%d_DEMhiresArElv(1,2,k) = gla06_prod%i_DEMhiresArElv(4,k) W

gla06%d_DEMhiresArElv(2,2,k) = gla06_prod%i_DEMhiresArElv(5,k) center

gla06%d_DEMhiresArElv(3,2,k) = gla06_prod%i_DEMhiresArElv(6,k) E

gla06%d_DEMhiresArElv(1,3,k) = gla06_prod%i_DEMhiresArElv(7,k) SW

gla06%d_DEMhiresArElv(2,3,k) = gla06_prod%i_DEMhiresArElv(8,k) S

gla06%d_DEMhiresArElv(3,3,k) = gla06_prod%i_DEMhiresArElv(9,k) SE

Comments:

Product Var Name i_ElevBiasCorr

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Elevation Bias Correction

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: mm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: NA

Product Minimum: 0

Product Maximum: 3000

Description: Correction to elevation based on post flight analysis for biases determined for each campaign. This bias correction has not been applied to the data so to apply it SUBTRACT the correction from the range estimate. To apply the correction to the elevations it must be ADDED to the elevation estimates.

Comments: See the altimeter user guide for full description.

Product Var Name i_spare42

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Spare 42

Product Data Type: i2b (4, 40)

Total Bytes: 320

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: n/a

Product Maximum: n/a

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: Spare 42

Product Var Name i_sigmaatt

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Attitude Quality Indicator

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: Unitless

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 6000

Description: Attitude quality indicator. Values: 0=good; 50=warning; 100=bad.

Comments: This indicator currently has only 3 values: 0, 50, and 100, leaving open the opportunity to use numbers in between for further resolution of the degradation as our knowledge improves.

Product Var Name i_Azimuth

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Local Azimuth

Product Data Type: i4b

Total Bytes: 4

Product Units: millideg

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 360000

Description: Mean azimuth measured clockwise from north based on latitude, longitude, and elevation of a 1 second interval of the trace of the ground footprint-center.

Comments:

Product Var Name i_SolAng

Is element of: GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Solar Angle

Product Data Type: i4b

Total Bytes: 4

Product Units: microdeg

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -90000000

Product Maximum: 90000000

Description: Solar Angle above or below the plane tangent to the ellipsoid surface at the laser spot. Positive values mean the sun is above the horizon, while negative values mean it is below the horizon. The effect of atmospheric refraction is not included. This is a low-precision value, with approximately one degree accuracy.

Comments:

Product Var Name i_tpintensity_avg

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Transmit Pulse intensity - frame avg

Product Data Type: i4b

Total Bytes: 4

Product Units: counts

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 25500

Description: Transmit pulse intensity as measured by the LPA. Average over the 1-second frame. From ANC09.

Comments:

Product Var Name i_tpazimuth_avg

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Transmit Pulse azimuth - frame avg

Product Data Type: i2b

Total Bytes: 2

Product Units: degrees*10

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 3600

Description: Transmit pulse azimuth. Average over the 1-second frame. Angle eastwards from north of the major axis of the transmit pulse, as seen by the LPA. From ANC09.

Comments:

Product Var Name i_tpeccentricity_avg

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Transmit Pulse eccentricity - frame avg

Product Data Type: i2b

Total Bytes: 2

Product Units: Unitless*1000

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1000

Description: Transmit pulse eccentricity as measured by the LPA. Average over the 1-second frame. From ANC09.

Comments:

Product Var Name i_tpmajoraxis_avg

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Transmit Pulse major axis - frame avg

Product Data Type: i2b

Total Bytes: 2

Product Units: cm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 10000

Description: Transmit pulse major axis as measured by the LPA. Average over the 1-second time frame. From ANC09.

Comments:

Product Var Name i_poTide

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Pole Tide

Product Data Type: i2b

Total Bytes: 2

Product Units: mm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -10000

Product Maximum: 10000

Description: Pole tide: an ocean tide which is the result of the Chandler
wobble (a free nutation of the Earth caused by fluctuating
pressure on the bottom of the ocean, caused by temperature
and salinity changes and wind-driven changes in the circulation
of the oceans).

Comments:

Product Var Name i_gdHt

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Geoid

Product Data Type: i2b (2)

Total Bytes: 4

Product Units: cm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -20000

Product Maximum: 20000

Description: The height of the geoid above the ellipsoid for the first and last shot in the record.

Comments:

Product Var Name i_erElv
Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: Solid Earth Tide Elevation (at first & last shot)
Product Data Type: i2b (2)
Total Bytes: 4
Product Units: mm
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -10000
Product Maximum: 10000
Description: The solid earth tide elevation for the first & last shot in the record.
Comments:

Product Var Name i_spElv
Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: Tide Elevations, Specific
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: mm
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -10000
Product Maximum: 10000
Description: A tide elevation calculated from alternate tide models for specific regions for shots 1, 11, 21, and 31.
Comments:

Product Var Name i_ldElv
Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: Load Tide Elevation
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: mm
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -10000
Product Maximum: 10000

Description: The load tide elevation applied to each shot. Elements 1-4 of the load tide vector are applied to shots 1-10, 11-20, 21-30, and 31-40, respectively.

Comments: The load tide is NOT NECESSARILY the load tide for shots 1,11,21,31. It is calculated for the first valid shot in each group of 10 and applied to all valid shots in the group.

Product Var Name i_spare12

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record

Short Description: Spares 12

Product Data Type: i2b (2)

Total Bytes: 4

Product Units: N/A

Invalid Value/Flag: None

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_wTrop

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Range Correction_Wet Troposphere

Product Data Type: i2b (2)

Total Bytes: 4

Product Units: mm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -1000

Product Maximum: 0

Description: The range correction due to the wet troposphere at first & last shot.

Comments:

Product Var Name i_dTrop

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA15 Record

Short Description: Range Correction, Dry Troposphere

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: mm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -2500

Product Maximum: 0

Description: The range correction due to the dry troposphere; one correction for each shot.Validity is based on results of finding a range with the standard fit.

Comments:

Product Var Name i_surfType

Is element of: GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Region Type

Product Data Type: i1b

Total Bytes: 1

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 1

Product Maximum: 15

Description: Describes the region type or types associated with each shot Ice Sheet, ocean, sea ice, or Land.

Please see <a href='flags/i_surfType.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_spare11

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record

Short Description: Spare 11

Product Data Type: i1b (3)

Total Bytes: 3

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: n/a

Product Maximum: n/a

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_DEM_elv

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record

Short Description: DEM Elevation

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: cm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -50000

Product Maximum: 1000000

Description: Elevation at the footprint location from the SRTM30 (GTOPO30 + SRTM) Digital Elevation Model (DEM). The reference frame for the DEM elevation was changed to the TOPEX/Poseidon ellipsoid to make it consistent with the GLAS elevations.

Comments:

Product Var Name i_refRng

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Reference Range

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 400000000

Product Maximum: 1000000000

Description: Range in distance calculated from the time between the centroid of the transmit pulse and the farthest gate from the spacecraft of the received pulse. See the rngcorrflg to determine any corrections that have been applied.

Comments:

Product Var Name i_TrshRngOff

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA15 Record

Short Description: Threshold Retracker Range Offset

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -150000

Product Maximum: 0

Description: Offset to be added to i_refRng to give the range in distance to the threshold retracker location on the received echo using standard parameters.

Comments:

Product Var Name i_spare47

Is element of: GLA06 record, GLA14 Record

Short Description: Spare 47

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: n/a

Product Maximum: n/a

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_SigEndOff

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA15 Record

Short Description: Signal End Range Offset

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -150000

Product Maximum: 0

Description: Offset to be added to i_refRng to give the range in distance to the location on the received echo calculated as the end of signal (farthest from the spacecraft) using standard parameters.

Comments:

Product Var Name i_cntRngOff

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA15 Record

Short Description: Centroid Range Offset

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -150000

Product Maximum: 0

Description: Offset to be added to i_refRng to give the range in distance to the location of the centroid of the received echo from signal begin through signal end defined by the standard parameters.

Comments:

Product Var Name i_reflctUC

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: reflctUC

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: Unitless*1E06

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1000000

Description: Reflectivity, not corrected for atmospheric effects, is calculated as Refl = R/T, where R is the received energy after it has been scaled for range, and T is the transmitted energy. i_reflctUC has also been calibrated for gain non-linearity (only for non-saturated waveforms), ground truth calibration and boresight shift shadowing (BSS). It is not corrected for saturation effects. If the shot is saturated (satindex above 2) then to correct for saturation the reflectivity estimate needs to be multiplied by the ratio of the corrected energy to the uncorrected energy (sat corrected reflectivity = i_reflctUC * (i_RecNrgAll + i_satNrgCorr)/i_RecNrgAll)

The atmospheric corrected reflectivity may be calculated from this uncorrected reflectivity by multiplying it by d_reflCor_atm.

i_reflctUC is invalid where GLA06%d_satNrgCorr is invalid.

Comments: This uses all signal between signal begin and signal end.

Product Var Name i_reflCor_atm

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Reflectivity Correction Factor For Atmospheric Effects

Product Data Type: i4b

Total Bytes: 4

Product Units: Unitless

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 1

Product Maximum: 250

Description: This reflectance correction factor is calculated as 1 / e^(-2(tc+ta+tp+tm)), where tc is the cloud (column) integrated optical depth, ta is the aerosol (column) integrated optical depth, tp is the planetary boundary

layer optical depth, and tm is the molecular optical depth. tm is a constant equal to -log(gd_T_RTatm)/2, where gd_T_RTatm = 0.98 is defined in const_elev_mod.f90 or read from ANC07-03. The attenuation correction factor has been corrected for multiple scattering. The reflectance has been corrected for waveform saturation.

Comments:

Product Var Name i_maxSmAmp

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Peak Amplitude of Smoothed Received Echo

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: Tenth of millivolts

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -300

Product Maximum: 30000

Description: The peak amplitude of the received echo after it has been smoothed to remove high frequency noise (see ATBD).

Comments: This is calculated after converting the return to voltage.

Product Var Name i_ocElv

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Ocean Tide Elevation

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: mm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -10000

Product Maximum: 10000

Description: The ocean tide elevation from the TPX07.1 tide model.

Comments:

Product Var Name i_numPk

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA15 Record

Short Description: Number of Peaks found in the Return

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 6

Description: The number of peaks in the return echo found by the Gaussian fitting procedure, using standard parameters.

Comments:

Product Var Name i_kurt2

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA15 Record

Short Description: Kurtosis of the Received Echo (standard)

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: unitless * 100

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -1000

Product Maximum: 1000

Description: Kurtosis of the received echo from signal begin to signal end using standard parameters

Comments: Note that the received echo was calibrated and converted to voltage before calculation.

Product Var Name i_skew2

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA15 Record

Short Description: Skewness

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: unitless * 100

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -10000

Product Maximum: 10000

Description: The skewness of the received echo from signal begin to signal end using standard parameters.

Comments: Note that the received echo was calibrated and converted to voltage before calculation.

Product Var Name i_spare4

Is element of: GLA06 record, GLA12 Record, GLA14 Record, GLA15 Record

Short Description: Spare 4

Product Data Type: i1b (160)

Total Bytes: 160

Product Units: null

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_isRngOff

Is element of: GLA06 record, GLA12 Record, GLA14 Record

Short Description: Ice Sheet Range Offset

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -150000

Product Maximum: 0

Description: Range offset to be added to i_refRng to calculate the range using the algorithm deemed appropriate for ice sheets.

Comments: Can be used for comparing elevations computed from results standard and alternate fitting.

Product Var Name i_siRngOff

Is element of: GLA06 record, GLA13 Record

Short Description: Sea Ice Range Offset

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -150000

Product Maximum: 0

Description: Range offset to be added to i_refRng to calculate the range using the algorithm deemed appropriate for sea ice.

Comments:

Product Var Name i_ldRngOff

Is element of: GLA06 record, GLA14 Record

Short Description: Land Range Offset

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -150000

Product Maximum: 0

Description: Range offset to be added to i_refRng to calculate the range using the algorithm deemed appropriate for land.

Comments:

Product Var Name i_ocRngOff

Is element of: GLA06 record, GLA15 Record

Short Description: Ocean Range Offset

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -150000

Product Maximum: 0

Description: Range offset to be added to i_refRng to calculate the range using the algorithm deemed appropriate for oceans.

Comments:

Product Var Name i_nPeaks1

Is element of: GLA05 record, GLA06 record, GLA14 Record

Short Description: Initial Number of Peaks in received echo (alternate)

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 50

Description: The initial number of peaks of the received echo; determined from the smoothed waveform, using alternative parameters

Comments:

Product Var Name i_ElvuseFlg

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Elevation use flag

Product Data Type: i1b (5)

Total Bytes: 5

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -127

Product Maximum: 127

Description: Flag indicating whether the elevations on this record should be used or not (1 bit set/shot). See the <a href='flags/i_ElvuseFlg.pdf'>PDF file</A> for more information.

Comments:

Product Var Name i_atm_avail

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Atmosphere Availability Flag

Product Data Type: i1b

Total Bytes: 1

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 15

Description: Please see <a href='flags/i_atm_avail.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_spare16

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Spare 16

Product Data Type: i1b (4)

Total Bytes: 4

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: n/a

Product Maximum: n/a

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_cld1_mswf

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Cloud Multiple Scattering Warning Flag

Product Data Type: i1b

Total Bytes: 1

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 15

Description: The multiple scattering warning flag (MSWF) is based on the total column optical depth (aerosol plus cloud) calculated in GLA11 using 532nm. It is intended as a way to quickly obtain information about the potential severity of multiple scattering with regards to the range-to-surface calculated by the altimetry processing software. It will be output on the GLA11 product for use by the altimetry group. The multiple scattering warning flag will have values ranging from 0-14, based on the total column optical depth as detailed in the PDF.

A warning flag value of 15 will signify ?invalid?. An invalid will be encoded if an optical depth in any of the layers in the 1-second column could not be calculated. This usually occurs in a very optically ?thick? cloud which extinguishes the signal. It could also occur if the extinction-to-backscatter ratio assignment is set too high, causing the transmission calculations in the lidar inversion to go out-of-range.Please see <a href='flags/i_cld1_mswf_elv.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_MRC_af

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Medium Resolution Cloud Availability Flag

Product Data Type: i1b

Total Bytes: 1

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 15

Description: Tells how many cloud layers were found at this resolution from the 532 nm channel. Please see <a href='flags/i_MRC_af.pdf'> the PDF flag description in the next section for more details. This parameter is extracted from the i_MRCL_flag on GLA09.

Comments:

Product Var Name i_spare9

Is element of: GLA06 record, GLA12 Record, GLA14 Record

Short Description: Spare 9

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: null

Invalid Value/Flag: N/A

Is Correction Flag?: NA

Is Unsigned?: NA

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_ElvFlg

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Elevation Definition Flag

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 127

Description: Indicates how location on the received echo was determined to calculate the elevation on the record.

Please see <a href='flags/i_ElvFlg.pdf'> the PDF flag description in the next section for more details. 'For GLA05, 06 and 12,13,14 and 15, bits are set to reflect the range offset used for that products elevation. Although defined as a pass-thru, the values are different on GLA06/12,13,15 and GLA14.'

Comments:

Product Var Name i_rng_UQF

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Range Offset Quality/Use Flag

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: Data quality flag for the range offsets on this record.

Please see <a href='flags/i_rng_UQF.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_spare49

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Spare 49

Product Data Type: i1b (10)

Total Bytes: 10

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_timecorflg

Is element of: GLA01 Main Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: time correction flag

Product Data Type: i2b

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: Indicates what instrument or bias corrections were applied to the times on this record. Please see <a href='flags/i_timecorflg.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_APID_AvFlg

Is element of: GLA01 Main Record, GLA02 Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: APID Data Availability Flag

Product Data Type: i1b (8)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -127

Product Maximum: 127

Description: Flag indicating which packets (APIDs) for each second are available missing, or filled. APID 19 is broken down further into Altimeter Digitizer, Photon Counter, Cloud Digitizer, GPS/DEM, and C&T sections.

Please see the PDF flag description in the next section for more details.

Comments:

Product Var Name i_AttFlg2

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Attitude Flag 2

Product Data Type: i1b (20)

Total Bytes: 20

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 15

Description: Denotes at 40/sec rate whether precision attitude was used to determine spot location, and if problems with LPA, etc.

Please see <a href='flags/i_AttFlg2.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_spare5

Is element of: GLA06 record

Short Description: Spare 5

Product Data Type: i1b

Total Bytes: 1

Product Units: NA

Invalid Value/Flag: N/A

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_FrameQF

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Altimeter Frame Quality Flag

Product Data Type: i1b

Total Bytes: 1

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1

Description: Denotes all bad data (no signal in whole frame), or all data good and all science team recommended corrections applied

Please see <a href='flags/i_FrameQF.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_OrbFlg

Is element of: GLA01 Main Record, GLA02 Record, GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: POD flag (Orbit Flag)

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 128

Description: Denotes quality of orbit, whether predicted or precision, loss of GPS data, maneuver-degraded, etc.

Please see <a href='flags/i_OrbFlg.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_rngCorrFlg

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Range Correction Flag

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: Denotes which geophysical or instrument corrections have been applied to the range in the calculation of the elevation on this record.

Please see <a href='flags/i_rngCorrFlg.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_CorrStatFlg

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Correction Status Flag

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: For each geophysical correction that has multiple values denotes which algorithm or model was used.

Please see <a href='flags/i_CorrStatFlg.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_spare15

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Spare 15

Product Data Type: i1b (8)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: n/a

Product Maximum: n/a

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_AttFlg1

Is element of: GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Attitude Flag 1

Product Data Type: i2b

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: At 1/sec denotes large off-nadir angle, ocn sweep, target of opportunity, steering to reference track.

Please see <a href='flags/i_AttFlg1.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_Spare6

Is element of: GLA06 record

Short Description: Spare 6

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: GLA06 spare6.

Product Var Name i_spare44

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record

Short Description: Spare 44

Product Data Type: i1b (120)

Total Bytes: 120

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: n/a

Product Maximum: n/a

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_satNdx

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Saturation Index

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: ns

Invalid Value/Flag: gi_invalid_i1b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 126

Description: The count of the number of gates in a waveform which have an amplitude greater than or equal to i_satNdxTh (set in anc07_0004). The value 126 means 126 or more gates are above the saturation index threshold (i_satNdxth).

Comments:

Product Var Name i_satElevCorr

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Saturation Elevation Correction

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: mm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 3000

Description: Correction to elevation for saturated waveforms. This correction has not been applied to the data so to apply it SUBTRACT the correction from the range estimate. To apply the correction to the elevations it must be ADDED to the elevation estimates.

Comments:

Product Var Name i_satCorrFlg

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Saturation Correction Flag

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: Yes

Is Unsigned?: NA

Product Minimum: NA

Product Maximum: NA

Description: Please see <a href='flags/i_satCorrFlg.pdf'> the PDF flag description in the next section for more details.

Bits 0-3: i_satElevCorr flag (4 bits); values indicated below:

0= Not Saturated (i_satNdx < 2) or No Signal

1= Sat. Correction is Inconsequential (i_satNdx >= 2 & i_pctSat < 2.0)

2= Sat. Correction is Applicable (i_satNdx >= 2 & i_pctSat >= 2.0 & Full Width* < 100ns)

3= Sat. Correction is Not Computable effects elevations can not be corrected

4= Sat. Correction model is Not Applicable so data can not be corrected (i_satNdx >= 2 & i_pctSat >= 2.0 & Full Width* >= 100ns) there are errors in the data but the effects on elevations can not be corrected

values 5-15=TBD

Bits 4-5: i_satNrgCorr flag (2 bits):

0=TBD

1=TBD

2=TBD

3=TBD

Bits 6-7: TBD:

0=TBD

1=TBD

2=TBD

3=TBD

Comments:

Product Var Name i_satNrgCorr

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Saturation Energy Correction

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: .01fJ

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 100

Description: Correction to energy for saturated waveforms. This correction has not been applied to the energy. It should be ADDED to any echo pulse energy calculated from the pulse area under the waveform. Also any reflectivity estimates need to be corrected for this error in energy measurement.

Comments:

Product Var Name i_spare13

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record

Short Description: Spare 13

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: null

Invalid Value/Flag: null

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_gval_rcv

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Gain Value used for Received Pulse

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: counts

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 255

Description: Gain value used for received pulse - uncalibrated.

Comments: This value is in counts and needs to be calibrated before calculating energy from it. Same as variable in GLA01_Long/i_gainSet1064.

Product Var Name i_RecNrgAll

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Received Energy signal begin to signal end

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: 0.01 fJoules

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32000

Description: This is a pass through of gla01%d_recNrgAll_EU, but stored in different units on the product. This is calculated by taking the area under the received waveform (referenced to the observed noise) from all responses between the noise crossing before the first threshold crossing and the noise crossing after the last threshold crossing. It is a rescaled value of GLA01 parameter d_recNrgAll_EU and is not recomputed.

Comments:

Product Var Name i_FRir_cldtop

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Full Resolution 1064 Cloud Top

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: deka-meters

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1030

Description: Full resolution (40 Hz) cloud top height obtained from the 1064 atmospheric channel. This parameter is for a 1 second record. This parameter is in GLA09.

Comments:

Product Var Name i_FRir_qaFlag

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Full Resolution 1064 Quality Flag

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 15

Description: One byte per data quality flag.

Value 15 = No clouds.

Value 14 = Indicates the likely presence of low clouds (< 150 m) based on elevated signal from the two bins above the ground return bin that were not detected directly by the cloud search algorithm. When this occurs, the 40 Hz cloud top height (i_Frir_cldtop) is set to a value of 0.10 km.

Value 13 = Indicates the possible presence of a cloud based on the value of the integrated signal parameter (i_FRir_intsig) that was not detected directly by the cloud search algorithm. When this occurs, the 40 Hz cloud top height (i_Frir_cldtop) is set to a value of 10.0 km.

Value 0 - 12 = Cloud detected by cloud search algorithm with higher numbers indicating a stronger average signal from the region starting at cloud top and extending 500 m below cloud top height. Please see <a href='flags/i_FRir_qaFlag.pdf'> the PDF flag description in the next section for more details. This parameter is extracted from the equivalent parameter on GLA09.

Comments:

Product Var Name i_atm_char_flag

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Atmosphere Characterization Flag

Product Data Type: i2b

Total Bytes: 2

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 10

Description: Flag to characterize cloud and blowing snow state of the atmosphere

0 clear

1 high cloud (> 5 km) low optical depth

2 high cloud (> 5 km), high optical depth

3 mid cloud (>2, <=5 km) low optical depth

4 mid cloud (>2, <=5 km) high optical depth

5 low cloud (> 500 m, <=2 km), low optical depth

6 low cloud (> 500 m, <=2 km), high optical depth

7 blowing snow or fog (< 500 m), low optical depth

8 blowing snow or fog (< 500 m), high optical depth

9 not tested

10 data quality insufficient to assign flag

Comments:

Product Var Name i_atm_char_conf

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Atmosphere Characterization Flag Confidence

Product Data Type: i2b

Total Bytes: 2

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 3

Description: Confidence level ascribed to the atmosphere characterization flag

Comments: 0 Not applicable (for contamination flag values of 9 or 10)

1 low confidence

2 reasonable confidence

3 high confidence

Product Var Name i_spare48

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Spare 48

Product Data Type: i1b (36)

Total Bytes: 36

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: n/a

Product Maximum: n/a

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_FRir_intsig

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Full Resolution 1064 Integrated Signal

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: e7/(m-sr)

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 10000

Description: Though called 'integrated signal' this is actually an average of all bins in the above-ground portion of the 1064 40 Hz profile with values above the threshold of 1.0e-7 (1/(m-sr) units). This parameter is for a 1 second record. This parameter is extracted from the equivalent parameter on GLA09.

Comments:

Product Var Name i_spare14

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Spare 14

Product Data Type: i1b (120)

Total Bytes: 120

Product Units: Unknown

Invalid Value/Flag: gi_invalid_i1b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_Surface_temp

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Surface Temperature

Product Data Type: i2b

Total Bytes: 2

Product Units: degrees Celsius * 100

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -10000

Product Maximum: 10000

Description: Atmospheric temperature at Earth's surface level measured in degrees Celsius and derived from the meteorological data files.

Comments:

Product Var Name i_Surface_pres

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Surface Pressure

Product Data Type: i2b

Total Bytes: 2

Product Units: hPa * 10

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 20000

Description: Atmospheric pressure at Earth's surface level measured in hPa and derived from the meteorological data files.

Comments:

Product Var Name i_Surface_relh

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Relative Humidity

Product Data Type: i2b

Total Bytes: 2

Product Units: percentage * 100

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 10000

Description: Atmospheric relative humidity at Earth's surface level measured as a percentage and derived from the meteorological data files.

Comments:

Product Var Name i_pctSAT

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Percent Saturation

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: percent

Invalid Value/Flag: gi_invalid_i1b

Is Correction Flag?: Yes

Is Unsigned?: NA

Product Minimum: -127

Product Maximum: 127

Description: Percent saturation (d_pctSAT) is calculated using the formula: d_pctSAT= 100*(saturation index)/(signal end - signal begin in nanoseconds). The alternate signal end/begin are used for GLA14%d_pctSAT, while the standard fit values are used for GLA06, 12, 13, and 15. The Saturation elevation correction is not applied in the geolocation processing computation of lat, lon and elev. Because the saturation corrections are small and data is acquired within 5 deg off nadir, effects on lat and lon can be ignored. To apply the saturation elevation correction to the elevations on the products it must be ADDED to the elevation estimates. Reported elevations for returns with invalid satElevCorr values and satCorrFlg values of 3 or 4 are likely to have large, uncorrectable errors and should be excluded from analyses.

Comments:

Product Var Name i_maxRecAmp

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Max Amplitude of Received Echo

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: Tenth of millivolts

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -300

Product Maximum: 30000

Description: Maximum Amplitude of the Received Echo.

Comments: This is calculated after converting the return to voltage. Use for scaling model fit RMS between normalized and un-normalized units.

Product Var Name i_sDevNsOb1

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Standard deviation of 1064 nm Background noise, (alternate)

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: 0.0001 volts

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 30000

Description: The standard deviation of the background noise (alternative parameters).

Comments: Can be used for computing signal-to-noise ratio along with unsmoothed max amplitude.

Product Var Name i_TxNrg

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: 1064 nm Laser Transmit Energy

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: 0.01 millijoules

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32766

Description: The 1064 nm laser pulse transmitted energy in energy units, computed from the digitized outgoing pulse, and the transmit gain.

Comments:

Product Var Name i_eqElv

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Equilibrium Tide Elevation (at first & last shot)

Product Data Type: i2b (2)

Total Bytes: 4

Product Units: mm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: NA

Product Minimum: -10000

Product Maximum: 10000

Description: The equilibrium (long period) tide at first and last valid shot over the ocean.

Comments:

Product Var Name i_Spare7

Is element of: GLA06 record, GLA12 Record, GLA13 Record

Short Description: Spare 7

Product Data Type: i1b (282)

Total Bytes: 282

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: GLA06, GLA12, GLA13 spare7.

Product Var Name i_rec_ndx

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: GLAS Record Index

Product Data Type: i4b

Total Bytes: 4

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: Unique index that relates this record to the corresponding record(s) in each GLAS data product.

Comments:

Product Var Name i_UTCTime

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Transmit Time of First Shot in frame in J2000

Product Data Type: i4b (2)

Total Bytes: 8

Product Units: seconds, microseconds

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: The transmit time of the first shot in the 1 second frame measured as 'UTC seconds' elapsed since Jan 1 2000 12:00:00 UTC. This time has been derived from the GPS time accounting for leap seconds. The first item is the whole

number of seconds; the second item is the fractional part in microseconds.

Comments: This is not the ground bounce time, but the transmit time.

Product Var Name i_beam_coelev

Is element of: GLA05 record, GLA07 Record

Short Description: Co-elevation

Product Data Type: i4b

Total Bytes: 4

Product Units: degrees*100

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 36000

Description: Co-elevation (CE) is direction from vertical of the laser beam as seen by an observer located at the laser ground spot.

Comments:

Product Var Name i_beam_azimuth

Is element of: GLA05 record, GLA07 Record

Short Description: Azimuth

Product Data Type: i4b

Total Bytes: 4

Product Units: degrees*100

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 36000

Description: The direction, eastwards from north, of the laser beam vector as seen by an observer at the laser ground spot viewing toward the spacecraft (i.e., the vector from the ground to the spacecraft). When the spacecraft is precisely at the geodetic zenith, the value will be 99999 degrees.

Comments:

Product Var Name i_spare0

Is element of: GLA07 Record

Short Description: Spares 0

Product Data Type: i1b (16)

Total Bytes: 16

Product Units: null

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: GLA07 spare0.

Product Var Name i_lat

Is element of: GLA07 Record

Short Description: Profile Coordinate, Latitude

Product Data Type: i4b

Total Bytes: 4

Product Units: microdegrees

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -90000000

Product Maximum: 90000000

Description: Profile coordinate in the IERS Terrestrial Reference Frame: east longitude and latitude, at the 1 hertz rate.

Comments:

Product Var Name i_lon

Is element of: GLA07 Record

Short Description: Profile Coordinate, Longitude

Product Data Type: i4b

Total Bytes: 4

Product Units: microdegrees

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 360000000

Description: Profile coordinate in the IERS Terrestrial Reference Frame: east longitude and latitude, at the 1 hertz rate.

Comments:

Product Var Name i_APID_AvFlg

Is element of: GLA01 Main Record, GLA02 Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: APID Data Availability Flag

Product Data Type: i1b (8)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -127

Product Maximum: 127

Description: Flag indicating which packets (APIDs) for each second are available missing, or filled. APID 19 is broken down further into Altimeter Digitizer, Photon Counter, Cloud Digitizer, GPS/DEM, and C&T sections.

Please see the PDF flag description in the next section for more details.

Comments:

Product Var Name i_OrbFlg

Is element of: GLA01 Main Record, GLA02 Record, GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: POD flag (Orbit Flag)

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 128

Description: Denotes quality of orbit, whether predicted or precision, loss of GPS data, maneuver-degraded, etc.

Please see <a href='flags/i_OrbFlg.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_LidarQF

Is element of: GLA07 Record

Short Description: Lidar Frame quality flag

Product Data Type: i2b

Total Bytes: 2

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 1

Description: Composite Flag - see Common Flag Spreadsheet for details

Please see <a href='flags/i_LidarQF.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_AttFlg1

Is element of: GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Attitude Flag 1

Product Data Type: i2b

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: At 1/sec denotes large off-nadir angle, ocn sweep, target of opportunity, steering to reference track.

Please see <a href='flags/i_AttFlg1.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_surfType

Is element of: GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Region Type

Product Data Type: i1b

Total Bytes: 1

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 1

Product Maximum: 15

Description: Describes the region type or types associated with each shot Ice Sheet, ocean, sea ice, or Land.

Please see <a href='flags/i_surfType.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_Spare1

Is element of: GLA07 Record

Short Description: Spare 1

Product Data Type: i1b

Total Bytes: 1

Product Units: NA

Invalid Value/Flag: N/A

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: GLA07 spare1.

Product Var Name i_SolAng

Is element of: GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Solar Angle

Product Data Type: i4b

Total Bytes: 4

Product Units: microdeg

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -90000000

Product Maximum: 90000000

Description: Solar Angle above or below the plane tangent to the ellipsoid surface at the laser spot. Positive values mean the sun is above the horizon, while negative values mean it is below the horizon. The effect of atmospheric refraction is not included. This is a low-precision value, with approximately one degree accuracy.

Comments:

Product Var Name i_pad_angle

Is element of: GLA07 Record

Short Description: PAD Angle

Product Data Type: i4b

Total Bytes: 4

Product Units: microdegrees

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 360000000

Description: Attitude angle calculated from PAD and POD.

Comments:

Product Var Name i_rng_geoid

Is element of: GLA07 Record

Short Description: Range of satellite above geoid

Product Data Type: i4b

Total Bytes: 4

Product Units: meters

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -1000

Product Maximum: 60000000

Description: Range of satellite above geoid based upon POD, PAD, and geoid

Comments:

Product Var Name i_topo_elev

Is element of: GLA07 Record

Short Description: Topographic elevation of surface above geoid

Product Data Type: i4b

Total Bytes: 4

Product Units: meters

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -2500

Product Maximum: 32000

Description: Topographic elevation of surface above geoid based upon POD, PAD, and geoid

Comments:

Product Var Name i_Rng2PCProf_Cor

Is element of: GLA07 Record

Short Description: Start Range of 532 nm Backscatter Profile

Product Data Type: i4b

Total Bytes: 4

Product Units: centimeters

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 50000000

Product Maximum: 70000000

Description: The range from the spacecraft to the start of the 532 nm backscatter profile - the start of the 40 KM segment of Lidar Data. This variable has a slight correction applied to it.

Comments: Not valid if APID19 is missing.

Product Var Name i_Rng2CDProf_Cor

Is element of: GLA07 Record

Short Description: Start Range of 1064 nm Backscatter Profile

Product Data Type: i4b

Total Bytes: 4

Product Units: meters

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 50000000

Product Maximum: 70000000

Description: The range from the spacecraft to the start of the 1064 nm backscatter profile - the start of the 20 KM segment of Lidar Data. This variable has a slight correction applied to it.

Comments:

Product Var Name i1_g_bg

Is element of: GLA02 Record, GLA07 Record

Short Description: 532nm Background at 1 Hz

Product Data Type: i4b (4)

Total Bytes: 16

Product Units: photons/bin * 100

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 100000

Description: The normalized 532 nm background counts from upper (1) and lower (2) integration intervals. (3) is background used to compute NRB. Averaged over 40 shots.

Comments: Not valid if APID15 is missing.

Product Var Name i5_g_bg

Is element of: GLA02 Record, GLA07 Record

Short Description: 532 nm Background at 5 Hz

Product Data Type: i4b (4, 5)

Total Bytes: 80

Product Units: photons/bin * 100

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 100000

Description: The normalized 532 nm background counts from upper (1) and lower (2) integration intervals.(3) is background used to compute NRB. Averaged over 8 shots.

Comments: Not valid if APID15 is missing.

Product Var Name i40_g_bg

Is element of: GLA02 Record, GLA07 Record

Short Description: 532 nm Background at 40 Hz

Product Data Type: i4b (4, 40)

Total Bytes: 640

Product Units: photons/bin * 100

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 100000

Description: The normalized 532 nm background counts from upper (1) and lower (2) integration intervals.(3) is background used to compute NRB.

Comments: Not valid if APID15 is missing.

Product Var Name i5_ir_bg

Is element of: GLA02 Record, GLA07 Record

Short Description: 1064 nm Background at 5 Hz

Product Data Type: i4b (4, 5)

Total Bytes: 80

Product Units: W*1.0d17

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100000000

Product Maximum: 100000000

Description: The normalized 1064 nm background counts from upper (1) and lower (2) integration intervals.(3) is background used to compute NRB. Averaged over 8 shots.

Comments: Not valid if APID15 is missing.

Product Var Name i40_ir_bg

Is element of: GLA02 Record, GLA07 Record

Short Description: 1064 nm Background at 40 Hz

Product Data Type: i4b (4, 40)

Total Bytes: 640

Product Units: W*1.0d17

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100000000

Product Maximum: 100000000

Description: The normalized 1064 nm background counts from upper (1) and lower (2) integration intervals.(3) is background used to compute NRB.

Comments: Not valid if APID17 is missing.

Product Var Name i5_g_TxNrg_EU

Is element of: GLA02 Record, GLA07 Record

Short Description: 532 nm Laser Transmit Energy at 5 Hz

Product Data Type: i4b (5)

Total Bytes: 20

Product Units: Joules * 1.0d5

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 4500

Description: The 532 nm transmitted pulse energy in energy units, converted from the counts from the transmitted energy monitor. Averaged over 8 shots.

Comments: Not valid if APID19 is missing.

Product Var Name i40_g_TxNrg_EU

Is element of: GLA02 Record, GLA07 Record

Short Description: 532 nm Laser Transmit Energy at 40 Hz

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: Joules * 1.0d5

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 4500

Description: The 532 nm transmitted pulse energy in energy units, converted from the counts from the transmitted energy monitor.

Comments: Not valid if APID19 is missing.

Product Var Name i5_ir_TxNrgEU

Is element of: GLA02 Record, GLA07 Record

Short Description: 1064 nm Laser Transmit Energy at 5 Hz

Product Data Type: i4b (5)

Total Bytes: 20

Product Units: Joules * 1.0d5

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 9000

Description: The 1064 nm laser pulse energy, computed from the digitized outgoing pulse and the detector temperature. Averaged over 8 shots.

Comments: Not valid if APID19 and APID12 or APID13 are missing.

Product Var Name i40_ir_TxNrgEU

Is element of: GLA02 Record, GLA07 Record

Short Description: 1064 nm Laser Transmit Energy at 40 Hz

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: Joules * 1.0d5

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 9000

Description: The 1064 nm laser pulse energy, computed from the digitized outgoing pulse and the detector temperature.

Comments: Not valid if APID19 and APID12 or APID13 are missing.

Product Var Name i_g_TxNrg_qf

Is element of: GLA02 Record, GLA07 Record

Short Description: 532 nm Laser Transmit Energy Quality Flag

Product Data Type: i1b (10)

Total Bytes: 10

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 3

Description: Evaluation of the 532 nm laser transmit energy which is an indication of the laser health; 2 bits per shot for 40 shots; 1 = full laser energy, 2 = marginal laser energy, 3 = deficient laser energy, 0 = not used.

Please see <a href='flags/i_g_TxNrg_qf.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_ir_TxNrg_qf

Is element of: GLA02 Record, GLA07 Record

Short Description: 1064 nm Laser Transmit Energy Quality Flag

Product Data Type: i1b (10)

Total Bytes: 10

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 3

Description: Evaluation of the 1064 nm laser transmit energy which is an indication of the laser health; 2 bits per shot for 40 shots; 1 = full laser energy, 2 = marginal laser energy, 3 = deficient laser energy, 0 = not used.

Please see <a href='flags/i_ir_TxNrg_qf.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_atm_dem

Is element of: GLA07 Record

Short Description: DEM value at current location from 1 km x 1 km grid

Product Data Type: i4b

Total Bytes: 4

Product Units: meters

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -32768

Product Maximum: 32768

Description: Surface height value for current location from 1 km x 1 km grid

Comments:

Product Var Name i_metFlg

Is element of: GLA07 Record

Short Description: Met/std atm source/quality flag

Product Data Type: i1b

Total Bytes: 1

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 15

Description: Flag indicating if met data or standard atmosphere data are used to fill met profiles. Flag is set to 1 if time of first file > 24 hrs, 2 if time of second file > 24 hrs, 2+index of standard atmosphere file if time of both files > 24 hrs.

Please see <a href='flags/i_metFlg.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_ir_bin_shift

Is element of: GLA07 Record

Short Description: 1064 vertical alignment offset

Product Data Type: i1b

Total Bytes: 1

Product Units: bins

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -10

Product Maximum: 10

Description: Number of bins that 1064 nm surface return bin is shifted to align with 532 nm surface return bin.

Comments:

Product Var Name i_Spare2

Is element of: GLA07 Record

Short Description: Spare 2

Product Data Type: i1b (6)

Total Bytes: 6

Product Units: NA

Invalid Value/Flag: N/A

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: GLA07 spare2.

Product Var Name i_g_cal_cof

Is element of: GLA07 Record

Short Description: 532 nm Backscatter Calibration Coefficient

Product Data Type: i4b (3)

Total Bytes: 12

Product Units: 1d-6*(Photons/bin)(km^3/J)sr

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 1.0d4

Product Maximum: 1.0d9

Description: The calibration value applied to the 532 nm lidar data to get the backscatter (1=high cal ht, 2=low cal ht, 3=used).

Comments:

Product Var Name i_ir_cal_cof

Is element of: GLA07 Record

Short Description: 1064 nm Backscatter Calibration Coefficient

Product Data Type: i4b (2)

Total Bytes: 8

Product Units: 1d4*(Watts)(km^3/J)sr

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 1.0d5

Product Maximum: 1.0d8

Description: The calibration value applied to the 1064 nm lidar data to get the backscatter (1=low cal ht, 2=used).

Comments:

Product Var Name i5_g_bscs

Is element of: GLA07 Record

Short Description: 532 nm Merged Attenuated Backscatter Profile 40 to -1 km

Product Data Type: i4b (548, 5)

Total Bytes: 10960

Product Units: e11/(m-sr)

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -1000

Product Maximum: 1000000000

Description: For the full vertical atmospheric profile (-1 to 41 km), the atmosphere 532 nm calibrated, attenuated backscatter profile at the rate of 5 per 1 second. When the 532 nm data becomes saturated the 1064 nm data is converted and merged into the data set. The Level 1A data that occurs at 40/second, every 8 shots are averaged and stored in the profile and the 1/second is replicated to get the full 5 Hz rate on this product.

Comments:

Product Var Name i40_g_bscs

Is element of: GLA07 Record

Short Description: 532 nm Merged Attenuated Backscatter Profile 10 to -1 km

Product Data Type: i4b (148, 40)

Total Bytes: 23680

Product Units: e11/(m-sr)

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -1000

Product Maximum: 1000000000

Description: For the 10 KM to -1 KM vertical segment, the atmosphere 532 nm calibrated, attenuated backscatter profile at the 40 per 1 second rate. When the 532 nm data becomes saturated the 1064 nm data is converted to 532 data and merged into the data set.

Comments:

Product Var Name i5_ir_bscs

Is element of: GLA07 Record

Short Description: 1064 nm Attenuated Backscatter Profile 20 to -1 km

Product Data Type: i4b (280, 5)

Total Bytes: 5600

Product Units: e11/(m-sr)

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -1000

Product Maximum: 1000000000

Description: Atmosphere 1064 nm calibrated, attenuated backscatter profile (-1 to 20 km) at the rate of 5 per 1 second. Averages of 8 shots are used for the Level 1A data that occurs at 40/second rate.

Comments:

Product Var Name i40_ir_bscs

Is element of: GLA07 Record

Short Description: 1064 nm Attenuated Backscatter Profile 10 to -1 km

Product Data Type: i4b (148, 40)

Total Bytes: 23680

Product Units: e11/(m-sr)

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -1000

Product Maximum: 1000000000

Description: Atmosphere 1064 nm calibrated, attenuated backscatter profile (-1 to 10 km) at the rate of 40 per 1 second.

Comments:

Product Var Name i_g_mbscs

Is element of: GLA07 Record

Short Description: 532 nm molecular backscatter cross section profile 40 to -1 km

Product Data Type: i4b (548)

Total Bytes: 2192

Product Units: e11/(m-sr)

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 1000

Product Maximum: 1000000

Description: 532 nm molecular backscatter profile computed from MET data interpolated in space and time to profile location.

Comments:

Product Var Name i_ir_mbscs

Is element of: GLA07 Record

Short Description: 1064 nm molecular backscatter cross section profile 20 to -1 km

Product Data Type: i4b (280)

Total Bytes: 1120

Product Units: e11/(m-sr)

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 1000

Product Maximum: 1000000

Description: 1064 nm molecular backscatter profile computed from MET data interpolated in space and time to profile location.

Comments:

Product Var Name i1_int_ret

Is element of: GLA07 Record

Short Description: 532 nm integrated return from 40 to 20 km

Product Data Type: i4b

Total Bytes: 4

Product Units: e11/(m-sr)

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 200000

Product Maximum: 100000000

Description: The integrated or summed 532 attenuated backscatter profile from 40 to 20 km. When normalized by the sum of the molecular backscatter for the same interval, gives an indication of data quality

Comments:

Product Var Name i40_g_sat_prof

Is element of: GLA07 Record

Short Description: 532 nm Saturation Flag Profile 10 to -1 km

Product Data Type: i1b (740)

Total Bytes: 740

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1

Description: 532 nm Saturation Flag Profile from 10 to -1 km. Indicates whether the 532 data were saturated and therefore whether the value is converted from the 1064 data. 0 = not saturated, 1 = saturated.

Please see <a href='flags/i40_g_sat_prof.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i5_g_sat_prof

Is element of: GLA07 Record

Short Description: 532 nm Saturation Flag Profile 40 to -1 km

Product Data Type: i1b (343)

Total Bytes: 343

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1

Description: 532 nm Saturation Flag Profile from 41 to -1 km. Indicates whether the 532 data were saturated and therefore whether the value is converted from the 1064 data. 0 = not saturated, 1 = saturated.

Please see <a href='flags/i5_g_sat_prof.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_spare3

Is element of: GLA07 Record

Short Description: Spares

Product Data Type: i1b (5)

Total Bytes: 5

Product Units: NA

Invalid Value/Flag: N/A

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_532AttBS_Flag

Is element of: GLA07 Record

Short Description: 532 nm Attenuated Backscatter Vertical Profile Flag

Product Data Type: i1b (18)

Total Bytes: 18

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 3

Description: Composite Flag - see Breakout for details

Please see <a href='flags/i_532AttBS_Flag.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_1064AttBS_Flag

Is element of: GLA07 Record

Short Description: 1064 nm Attenuated Backscatter Vertical Profile Flag

Product Data Type: i1b (18)

Total Bytes: 18

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 3

Description: Composite Flag - see Breakout for details

Please see <a href='flags/i_1064AttBS_Flag.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_AttFlg3

Is element of: GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Attitude Flag 3

Product Data Type: i1b

Total Bytes: 1

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1

Description: Please see <a href='flags/i_AttFlg3.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_DitheringEnabledFlag

Is element of: GLA02 Record, GLA07 Record

Short Description: Dithering Enabled Flag

Product Data Type: i1b

Total Bytes: 1

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: Yes

Is Unsigned?: NA

Product Minimum: 0

Product Maximum: 1

Description: 0=FALSE, 1=TRUE

Comments: Not valid if APID15 is missing.

Product Var Name i_timecorflg

Is element of: GLA01 Main Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: time correction flag

Product Data Type: i2b

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: Indicates what instrument or bias corrections were applied to the times on this record. Please see <a href='flags/i_timecorflg.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_Surface_temp

Is element of: GLA07 Record

Short Description: Surface Temperature
Product Data Type: i2b
Total Bytes: 2
Product Units: degrees Celsius * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -10000
Product Maximum: 10000
Description:
Comments:

Product Var Name i_Surface_pres
Is element of: GLA07 Record
Short Description: Surface Pressure
Product Data Type: i2b
Total Bytes: 2
Product Units: hPa * 10
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 20000
Description:
Comments:

Product Var Name i_Surface_relh
Is element of: GLA07 Record
Short Description: Relative Humidity
Product Data Type: i2b
Total Bytes: 2
Product Units: percentage * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 10000
Description:
Comments:

Product Var Name i_Surface_wind

Is element of: GLA07 Record, GLA15 Record

Short Description: Surface Wind Speed

Product Data Type: i2b

Total Bytes: 2

Product Units: meters/second * 100

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 20000

Description: Wind speed at Earth's surface level measured in km/hour and derived from the meteorological data files.

Comments:

Product Var Name i_Surface_wdir

Is element of: GLA07 Record, GLA15 Record

Short Description: Surface Wind Direction Azimuth from North

Product Data Type: i2b

Total Bytes: 2

Product Units: degrees * 10

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 3600

Description: Wind direction at Earth's surface level measured in degrees of azimuth from North and derived from the meteorological data files.

Comments:

Product Var Name i_spare4

Is element of: GLA07 Record

Short Description: Spare 4

Product Data Type: i1b (130)

Total Bytes: 130

Product Units: NA

Invalid Value/Flag: N/A

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_rec_ndx

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: GLAS Record Index

Product Data Type: i4b

Total Bytes: 4

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: Unique index that relates this record to the corresponding record(s) in each GLAS data product.

Comments:

Product Var Name i_UTCTime

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Transmit Time of First Shot in frame in J2000

Product Data Type: i4b (2)

Total Bytes: 8

Product Units: seconds, microseconds

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: The transmit time of the first shot in the 1 second frame measured as 'UTC seconds' elapsed since Jan 1 2000 12:00:00 UTC. This time has been derived from the GPS time accounting for leap seconds. The first item is the whole number of seconds; the second item is the fractional part in microseconds.

Comments: This is not the ground bounce time, but the transmit time.

Product Var Name i_beam_coelev

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Co-elevation

Product Data Type: i4b (4)

Total Bytes: 16

Product Units: degrees*100

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 36000

Description: Co-elevation (CE) is direction from vertical of the laser beam as seen by an observer located at the laser ground spot.

Comments:

Product Var Name i_beam_azimuth

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Azimuth

Product Data Type: i4b (4)

Total Bytes: 16

Product Units: degrees*100

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 36000

Description: Azimuth (Az) is the direction clockwise from north of the laser beam as seen by an observer at the laser ground spot.

Comments:

Product Var Name i_pad_angle

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: PAD Angle

Product Data Type: i4b (4)

Total Bytes: 16

Product Units: microdegrees

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 3600000000

Description: Attitude angle calculated from PAD and POD.Comments:

Product Var Name i_spare0

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Spares 0

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: null

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_AttFlg1

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Attitude flag

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: Composite Flag - see Common Flag Spreadsheet for details

Please see <a href='flags/i_AttFlg1.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_lat

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Profile Location, Latitude

Product Data Type: i4b (4)

Total Bytes: 16

Product Units: microdegrees

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -90000000

Product Maximum: 90000000

Description: Profile coordinate in the IERS Terrestrial Reference Frame: east longitude and latitude, at the 1 hertz rate.

Comments:

Product Var Name i_lon

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Profile Location, Longitude

Product Data Type: i4b (4)

Total Bytes: 16

Product Units: microdegrees

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 360000000

Description: Profile coordinate in the IERS Terrestrial Reference Frame: east longitude and latitude, at the 1 hertz rate.

Comments:

Product Var Name i_OrbFlg

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Orbit flag

Product Data Type: i1b (2, 4)

Total Bytes: 8

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 128

Description: Composite Flag - see Common Flag Spreadsheet for details

Please see <a href='flags/i_OrbFlg.pdf'> the PDF flag description in the next section for more details.

There are 4 sets of this flag value, 1/sec for each of the 4 sec covered in the record.

Comments:

Product Var Name i_surfType

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Region Type

Product Data Type: i1b (4)
Total Bytes: 4
Product Units: NA
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 1
Product Maximum: 15
Description: Describes the region type or types associated with each shot Ice Sheet, ocean, sea ice, or Land.
Please see <a href='flags/i_surfType.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_LidarQF
Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record
Short Description: Lidar Frame quality flag
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: NA
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: null
Product Maximum: null
Description: Composite Flag - see Common Flag Spreadsheet for details
Please see <a href='flags/i_LidarQF.pdf'> the PDF flag description in the next section for more details.
Comments:

Product Var Name i_atm_dem
Is element of: GLA08 Record
Short Description: DEM value at current location from 1 km x 1 km grid
Product Data Type: i4b (4)
Total Bytes: 16
Product Units: meters
Invalid Value/Flag: gi_invalid_i4b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -32768
Product Maximum: 32768
Description: Surface height value for current location from 1 km x 1 km grid

Comments:

Product Var Name i4_aer_bot
Is element of: GLA08 Record
Short Description: Below 20 KM Aerosol Layer Bottom at 532 nm
Product Data Type: i2b (5)
Total Bytes: 10
Product Units: deka-meters
Invalid Value/Flag: i4_aer_af
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -100
Product Maximum: 2000
Description: The aerosol layer bottoms (below 20 KM in atmosphere) for up to 5 layers at 1 per 4 sec.
Comments:

Product Var Name i4_aer_top
Is element of: GLA08 Record
Short Description: Below 20 KM Aerosol Layer Top at 532 nm
Product Data Type: i2b (5)
Total Bytes: 10
Product Units: deka-meters
Invalid Value/Flag: i4_aer_af
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -100
Product Maximum: 2000
Description: The aerosol layer tops (below 20 KM in atmosphere) for up to 5 layers at 1 per 4 sec.
Comments:

Product Var Name i20_aer_bot
Is element of: GLA08 Record
Short Description: 20-40 KM Aerosol Layer Bottom at 532 nm
Product Data Type: i2b (3)
Total Bytes: 6
Product Units: deka-meters
Invalid Value/Flag: i20_aer_af
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 1000

Product Maximum: 4000

Description: The aerosol layer bottoms (20 - 40 KM in atmosphere) for up to 3 layers at 1 per 4 sec.

Comments:

Product Var Name i20_aer_top

Is element of: GLA08 Record

Short Description: 20-40 KM Aerosol Layer Top at 532 nm

Product Data Type: i2b (3)

Total Bytes: 6

Product Units: deka-meters

Invalid Value/Flag: i20_aer_af

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 1000

Product Maximum: 4000

Description: The aerosol layer tops (20 - 40 KM in atmosphere) for up to 3 layers at 1 per 4 sec.

Comments:

Product Var Name i_LRpbl_ht

Is element of: GLA08 Record

Short Description: Low Resolution PBL Height at 532 nm

Product Data Type: i2b

Total Bytes: 2

Product Units: deka-meters

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100

Product Maximum: 700

Description: Low resolution height of the planetary boundary layer, as derived from the aerosol structure; the low resolution data is averaged over 4 seconds.

Comments:

Product Var Name i_LRpbl_grd

Is element of: GLA08 Record

Short Description: Ground Detection for Low Res PBL at 532 nm

Product Data Type: i2b

Total Bytes: 2

Product Units: deka-meters

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100

Product Maximum: 1000

Description: The height above the reference ellipsoid of the ground used by the low res PBL processing algorithms.

Comments:

Product Var Name i_HRpbl_ht

Is element of: GLA08 Record

Short Description: High Resolution PBL Height at 532 nm

Product Data Type: i2b (20)

Total Bytes: 40

Product Units: deka-meters

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100

Product Maximum: 700

Description: High resolution height of the planetary boundary layer, as derived from the aerosol structure; the high resolution data occurs at the rate of 5 per second.

Comments:

Product Var Name i_HRpbl_grd

Is element of: GLA08 Record

Short Description: Ground Detection for High Res PBL

Product Data Type: i2b (20)

Total Bytes: 40

Product Units: deka-meters

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100

Product Maximum: 1000

Description: The height above the reference ellipsoid of the ground used by the high res PBL processing algorithms.

Comments:

Product Var Name i4_aer_pct

Is element of: GLA08 Record

Short Description: Percentage of Saturated Bins in Below 20 KM Aerosol Layers at 532 nm

Product Data Type: i1b (5)

Total Bytes: 5
Product Units: unitless
Invalid Value/Flag: i4_aer_af
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 100
Description: Percentage of Saturated Bins in Below 20 KM Aerosol Layers at 532 nm
Comments:

Product Var Name i20_aer_pct
Is element of: GLA08 Record
Short Description: Percentage of Saturated Bins in 20-40 KM Aerosol Layers at 532 nm
Product Data Type: i1b (3)
Total Bytes: 3
Product Units: unitless
Invalid Value/Flag: i20_aer_af
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 100
Description: Percentage of Saturated Bins in 20-40 KM Aerosol Layers at 532 nm
Comments:

Product Var Name i_LRpbl_pct
Is element of: GLA08 Record
Short Description: Percentage of Saturated Bins in Low Resolution PBL Layer at 532 nm
Product Data Type: i1b
Total Bytes: 1
Product Units: unitless
Invalid Value/Flag: gi_invalid_i1b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 100
Description: Percentage of Saturated Bins in Low Resolution PBL Layer at 532 nm
Comments:

Product Var Name i_LayHgt_Flag
Is element of: GLA08 Record

Short Description: Layer Height Flag

Product Data Type: i1b (32)

Total Bytes: 32

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 15

Description: Composite Flag - see Breakout for details

Please see <a href='flags/i_LayHgt_Flag.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_AttFlg3

Is element of: GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Attitude Flag 3

Product Data Type: i1b

Total Bytes: 1

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1

Description: Please see <a href='flags/i_AttFlg3.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_timecorflg

Is element of: GLA01 Main Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: time correction flag

Product Data Type: i2b

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: Indicates what instrument or bias corrections were applied to the times on this record. Please see <a href='flags/i_timecorflg.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_SolarAngle

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Solar Angle

Product Data Type: i4b (4)

Total Bytes: 16

Product Units: micro-degrees

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -90000000

Product Maximum: 90000000

Description: Solar Angle above or below the plane tangent to the ellipsoid surface at the laser spot. Positive values mean the sun is above the horizon, while negative values mean it is below the horizon. The effect of atmospheric refraction is not included. This is a low-precision value, with approximately one degree accuracy.

Comments:

Product Var Name i_Aer_top_b20_temp

Is element of: GLA08 Record

Short Description: Temperature of Top of Aerosol Layers in Bottom 20km of Atmosphere at 532 nm

Product Data Type: i2b (5)

Total Bytes: 10

Product Units: degrees Celsius * 100

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -10000

Product Maximum: 10000

Description: Temperature of Top of Aerosol Layers in Bottom 20km of Atmosphere at 532 nm

Comments:

Product Var Name i_Aer_top_b20_pres

Is element of: GLA08 Record

Short Description: Pressure of Top of Aerosol Layers in Bottom 20km of Atmosphere at 532 nm

Product Data Type: i2b (5)

Total Bytes: 10

Product Units: hPa * 10

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 20000
Description: Pressure of Top of Aerosol Layers in Bottom 20km of Atmosphere at 532 nm
Comments:

Product Var Name i_Aer_top_b20_relh
Is element of: GLA08 Record
Short Description: Relative Humidity of Top of Aerosol Layers in Bottom 20km of Atm at 532 nm
Product Data Type: i2b (5)
Total Bytes: 10
Product Units: percentage * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 10000
Description: Relative Humidity of Top of Aerosol Layers in Bottom 20km of Atmosphere at 532 nm
Comments:

Product Var Name i_Aer_bot_b20_temp
Is element of: GLA08 Record
Short Description: Temperature of Bottom of Aerosol Layers in Bottom 20km of Atmosphere at 532 nm
Product Data Type: i2b (5)
Total Bytes: 10
Product Units: degrees Celsius * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -10000
Product Maximum: 10000
Description: Temperature of Bottom of Aerosol Layers in Bottom 20km of Atmosphere at 532 nm
Comments:

Product Var Name i_Aer_bot_b20_pres
Is element of: GLA08 Record
Short Description: Pressure of Bottom of Aerosol Layers in Bottom 20km of Atmosphere at 532 nm
Product Data Type: i2b (5)
Total Bytes: 10

Product Units: hPa * 10
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 20000
Description: Pressure of Bottom of Aerosol Layers in Bottom 20km of Atmosphere at 532 nm
Comments:

Product Var Name i_Aer_bot_b20_relh
Is element of: GLA08 Record
Short Description: Relative Humidity of Bottom of Aerosol Layers in Bottom 20km of Atm at 532 nm
Product Data Type: i2b (5)
Total Bytes: 10
Product Units: percentage * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 10000
Description: Relative Humidity of Bottom of Aerosol Layers in Bottom 20km of Atmosphere at 532 nm
Comments:

Product Var Name i_Aer_top_a20_temp
Is element of: GLA08 Record
Short Description: Temperature of Top of Aerosol Layers Above 20km of Atmosphere at 532 nm
Product Data Type: i2b (3)
Total Bytes: 6
Product Units: degrees Celsius * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: No
Is Unsigned?: No
Product Minimum: -10000
Product Maximum: 10000
Description: Temperature of Top of Aerosol Layers Above 20km of Atmosphere at 532 nm
Comments:

Product Var Name i_Aer_top_a20_pres
Is element of: GLA08 Record
Short Description: Pressure of Top of Aerosol Layers Above 20km of Atmosphere at 532 nm

Product Data Type: i2b (3)
Total Bytes: 6
Product Units: hPa * 10
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 20000
Description: Pressure of Top of Aerosol Layers Above 20km of Atmosphere at 532 nm
Comments:

Product Var Name i_Aer_top_a20_relh
Is element of: GLA08 Record
Short Description: Relative Humidity of Top of Aerosol Layers Above 20km of Atmosphere at 532 nm
Product Data Type: i2b (3)
Total Bytes: 6
Product Units: percentage * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 10000
Description: Relative Humidity of Top of Aerosol Layers Above 20km of Atmosphere at 532 nm
Comments:

Product Var Name i_Aer_bot_a20_temp
Is element of: GLA08 Record
Short Description: Temperature of Bottom of Aerosol Layers Above 20km of Atmosphere at 532 nm
Product Data Type: i2b (3)
Total Bytes: 6
Product Units: degrees Celsius * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -10000
Product Maximum: 10000
Description: Temperature of Bottom of Aerosol Layers Above 20km of Atmosphere at 532 nm
Comments:

Product Var Name i_Aer_bot_a20_pres

Is element of: GLA08 Record
Short Description: Pressure of Bottom of Aerosol Layers Above 20km of Atmosphere at 532 nm
Product Data Type: i2b (3)
Total Bytes: 6
Product Units: hPa * 10
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 20000
Description: Pressure of Bottom of Aerosol Layers Above 20km of Atmosphere at 532 nm
Comments:

Product Var Name i_Aer_bot_a20_relh
Is element of: GLA08 Record
Short Description: Relative Humidity of Bottom of Aerosol Layers Above 20km of Atmosphere at 532 nm
Product Data Type: i2b (3)
Total Bytes: 6
Product Units: percentage * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 10000
Description: Relative Humidity of Bottom of Aerosol Layers Above 20km of Atmosphere at 532 nm
Comments:

Product Var Name i_Aer_PBL_LR_temp
Is element of: GLA08 Record, GLA11 Record
Short Description: Temperature of Low Resolution Planetary Boundary Layer Top at 532 nm
Product Data Type: i2b
Total Bytes: 2
Product Units: degrees Celsius * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -10000
Product Maximum: 10000
Description: Temperature of Low Resolution Planetary Boundary Layer Top at 532 nm
Comments:

Product Var Name i_Aer_PBL_LR_pres
Is element of: GLA08 Record, GLA11 Record
Short Description: Pressure of Low Resolution Planetary Boundary Layer Top at 532 nm
Product Data Type: i2b
Total Bytes: 2
Product Units: hPa * 10
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 20000
Description: Pressure of Low Resolution Planetary Boundary Layer Top at 532 nm
Comments:

Product Var Name i_Aer_PBL_LR_relh
Is element of: GLA08 Record, GLA11 Record
Short Description: Relative Humidity of Low Resolution Planetary Boundary Layer Top at 532 nm
Product Data Type: i2b
Total Bytes: 2
Product Units: percentage * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 10000
Description: Relative Humidity of Low Resolution Planetary Boundary Layer Top at 532 nm
Comments:

Product Var Name i_Aer_ir_top
Is element of: GLA08 Record, GLA11 Record
Short Description: Elevation of Top of Aerosol Layers Detected in 1064 nm
Product Data Type: i2b (2)
Total Bytes: 4
Product Units: deka-meters
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -100
Product Maximum: 2200

Description: Elevation of Top of Aerosol Layers detected in 1064 nm

Comments:

Product Var Name i_Aer_ir_bot

Is element of: GLA08 Record, GLA11 Record

Short Description: Elevation of Bottom of Aerosol Layers Detected in 1064 nm

Product Data Type: i2b (2)

Total Bytes: 4

Product Units: deka-meters

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100

Product Maximum: 2200

Description: Elevation of Bottom of Aerosol Layers Detected in 1064 nm.

Comments:

Product Var Name i_Aer_ir_layflg

Is element of: GLA08 Record

Short Description: Layer Flag for 1064 Aerosol

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: Please see <a href='flags/i_Aer_ir_layflg.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_Aer_ir_top_temp

Is element of: GLA08 Record, GLA11 Record

Short Description: Temperature of Top of Aerosol Layers Detected in 1064 nm

Product Data Type: i2b (2)

Total Bytes: 4

Product Units: degrees Celsius * 100

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -10000
Product Maximum: 10000
Description: Temperature of Top of Aerosol Layers Detected in 1064 nm
Comments:

Product Var Name i_Aer_ir_top_pres
Is element of: GLA08 Record, GLA11 Record
Short Description: Pressure of Top of Aerosol Layers Detected in 1064 nm
Product Data Type: i2b (2)
Total Bytes: 4
Product Units: hPa * 10
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 20000
Description: Pressure of Top of Aerosol Layers Detected in 1064 nm
Comments:

Product Var Name i_Aer_ir_top_relh
Is element of: GLA08 Record, GLA11 Record
Short Description: Relative Humidity of Top of Aerosol Layers Detected in 1064 nm
Product Data Type: i2b (2)
Total Bytes: 4
Product Units: percentage * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 10000
Description: Relative Humidity of Top of Aerosol Layers Detected in 1064 nm
Comments:

Product Var Name i_Aer_ir_bot_temp
Is element of: GLA08 Record, GLA11 Record
Short Description: Temperature of Bottom of Aerosol Layers Detected in 1064 nm
Product Data Type: i2b (2)
Total Bytes: 4
Product Units: degrees Celsius * 100
Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -10000
Product Maximum: 10000
Description: Temperature of Bottom of Aerosol Layers Detected in 1064 nm
Comments:

Product Var Name i_Aer_ir_bot_pres
Is element of: GLA08 Record, GLA11 Record
Short Description: Pressure of Bottom of Aerosol Layers Detected in 1064 nm
Product Data Type: i2b (2)
Total Bytes: 4
Product Units: hPa * 10
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 20000
Description: Pressure of Bottom of Aerosol Layers Detected in 1064 nm
Comments:

Product Var Name i_Aer_ir_bot_relh
Is element of: GLA08 Record, GLA11 Record
Short Description: Relative Humidity of Bottom of Aerosol Layers Detected in 1064 nm
Product Data Type: i2b (2)
Total Bytes: 4
Product Units: percentage * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 10000
Description: Relative Humidity of Bottom of Aerosol Layers Detected in 1064 nm
Comments:

Product Var Name i_Surface_temp
Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record
Short Description: Surface Temperature
Product Data Type: i2b (4)
Total Bytes: 8

Product Units: degrees Celsius * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -10000
Product Maximum: 10000
Description: Surface Temperature, 4 of 1-second intervals.
Comments:

Product Var Name i_Surface_pres
Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record
Short Description: Surface Pressure
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: hPa * 10
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 20000
Description: Surface Pressure, 4 of 1-second intervals.
Comments:

Product Var Name i_Surface_relh
Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record
Short Description: Surface Relative Humidity
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: percentage * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 10000
Description: Surface Relative Humidity, 4 of 1-second intervals.
Comments:

Product Var Name i_Surface_wind
Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record
Short Description: Surface Wind Speed

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: meters/second * 100

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 20000

Description: Surface Wind Speed, 4 of 1-second intervals. Wind speed at Earth's surface level measured in km/hour and derived from the meteorological data files.

Comments:

Product Var Name i_Surface_wdir

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Surface Wind Direction Azimuth from North

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: degrees * 10

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 3600

Description: Surface wind direction azimuth from North, 4 of 1-second intervals. Wind direction at Earth's surface level measured in degrees of azimuth from North and derived from the meteorological data files.

Comments:

Product Var Name i_PBL_Layer_ht

Is element of: GLA08 Record, GLA09 Record

Short Description: PBL Layer Height from Met Data

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: deka-meters

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100

Product Maximum: 1000

Description:

Comments:

Product Var Name i_Spec_Humid
Is element of: GLA08 Record, GLA09 Record
Short Description: Specific Humidity
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: gram/kilogram*100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 1000
Description: Specific humidity 2m above ground.
Comments:

Product Var Name i_Temp2mAbvGrnd
Is element of: GLA08 Record, GLA09 Record
Short Description: Temperature 2m Above Ground Level
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: degrees Celsius * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -10000
Product Maximum: 10000
Description:
Comments:

Product Var Name i_Total_CloudCov
Is element of: GLA08 Record, GLA09 Record
Short Description: Total Cloud Cover
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: percentage
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 100
Description:

Comments:

Product Var Name i_spare2

Is element of: GLA08 Record

Short Description: Spares

Product Data Type: i1b (232)

Total Bytes: 232

Product Units: NA

Invalid Value/Flag: N/A

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: GLA08 spare2.

Product Var Name i_rec_ndx

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: GLAS Record Index

Product Data Type: i4b

Total Bytes: 4

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: Unique index that relates this record to the corresponding record(s) in each GLAS data product.

Comments:

Product Var Name i_UTCTime

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Transmit Time of First Shot in frame in J2000

Product Data Type: i4b (2)

Total Bytes: 8

Product Units: seconds, microseconds

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: The transmit time of the first shot in the 1 second frame measured as 'UTC seconds' elapsed since Jan 1 2000 12:00:00 UTC. This time has been derived from the GPS time accounting for leap seconds. The first item is the whole

number of seconds; the second item is the fractional part in microseconds.

Comments: This is not the ground bounce time, but the transmit time.

Product Var Name i_beam_coelev

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Co-elevation

Product Data Type: i4b (4)

Total Bytes: 16

Product Units: degrees*100

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 36000

Description: Co-elevation (CE) is direction from vertical of the laser beam as seen by an observer located at the laser ground spot.

Comments:

Product Var Name i_beam_azimuth

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Azimuth

Product Data Type: i4b (4)

Total Bytes: 16

Product Units: degrees*100

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 36000

Description: Azimuth (Az) is the direction clockwise from north of the laser beam as seen by an observer at the laser ground spot.

Comments:

Product Var Name i_pad_angle

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: PAD Angle

Product Data Type: i4b (4)

Total Bytes: 16

Product Units: microdegrees

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 3600000000

Description: Attitude angle calculated from PAD and POD.

Comments:

Product Var Name i_spare0

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Spares 0

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: null

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_AttFlg1

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Attitude flag

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: Composite Flag - see Common Flag Spreadsheet for details

Please see <a href='flags/i_AttFlg1.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_lat

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Profile Location, Latitude

Product Data Type: i4b (4)

Total Bytes: 16

Product Units: microdegrees

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -90000000

Product Maximum: 90000000

Description: Profile coordinate in the IERS Terrestrial Reference Frame: east longitude and latitude, at the 1 hertz rate.

Comments:

Product Var Name i_lon

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Profile Location, Longitude

Product Data Type: i4b (4)

Total Bytes: 16

Product Units: microdegrees

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 360000000

Description: Profile coordinate in the IERS Terrestrial Reference Frame: east longitude and latitude, at the 1 hertz rate.

Comments:

Product Var Name i_OrbFlg

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Orbit flag

Product Data Type: i1b (2, 4)

Total Bytes: 8

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 128
Description: Composite Flag - see Common Flag Spreadsheet for details
Please see <a href='flags/i_OrbFlg.pdf'> the PDF flag description in the next section for more details.
There are 4 sets of this flag value, 1/sec for each of the 4 sec covered in the record.
Comments:

Product Var Name i_surfType
Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record
Short Description: Region Type
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: NA
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 1
Product Maximum: 15
Description: Describes the region type or types associated with each shot Ice Sheet, ocean, sea ice, or Land.
Please see <a href='flags/i_surfType.pdf'> the PDF flag description in the next section for more details.
Comments:

Product Var Name i_LidarQF
Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record
Short Description: Lidar Frame quality flag
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: NA
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: null
Product Maximum: null
Description: Composite Flag - see Common Flag Spreadsheet for details
Please see <a href='flags/i_LidarQF.pdf'> the PDF flag description in the next section for more details.
Comments:

Product Var Name i_spare2

Is element of: GLA09 Record

Short Description: Spare 2

Product Data Type: i1b (8)

Total Bytes: 8

Product Units: NA

Invalid Value/Flag: N/A

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: GLA09 spare2.

Product Var Name i_topo_elev

Is element of: GLA09 Record

Short Description: Topographic elevation of surface above geoid

Product Data Type: i4b (4)

Total Bytes: 16

Product Units: meters

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -2500

Product Maximum: 32000

Description: Topographic elevation of surface above geoid based upon POD, PAD, and geoid

Comments:

Product Var Name i_atm_dem

Is element of: GLA09 Record

Short Description: DEM value at current location from 1 km x 1 km grid

Product Data Type: i4b (4)

Total Bytes: 16

Product Units: meters

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -32768

Product Maximum: 32768

Description: Surface height value for current location from 1 km x 1 km grid

Comments:

Product Var Name i_LRcld_bot

Is element of: GLA09 Record

Short Description: Low Resolution Cloud Bottom at 532 nm

Product Data Type: i2b (10)

Total Bytes: 20

Product Units: deka-meters

Invalid Value/Flag: i_LRC_af

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100

Product Maximum: 2000

Description: Low resolution height above the reference ellipsoid of the bottom of a cirrus, thin, or dense cloud layer in the atmosphere. There can be up to 10 cloud layers in an atmospheric profile. The low resolution data occurs at the rate of once per 4 seconds.

Comments:

Product Var Name i_LRcld_top

Is element of: GLA09 Record

Short Description: Low Resolution Cloud Top at 532 nm

Product Data Type: i2b (10)

Total Bytes: 20

Product Units: deka-meters

Invalid Value/Flag: i_LRC_af

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100

Product Maximum: 2000

Description: Low resolution height above the reference ellipsoid of the top of a cirrus, thin, or dense cloud layer in the atmosphere. There can be up to 10 cloud layers in an atmospheric profile. The low resolution data occurs at the rate of once per 4 seconds.

Comments:

Product Var Name i_LRcld_grd

Is element of: GLA09 Record

Short Description: Low Resolution Ground Detection at 532 nm

Product Data Type: i2b

Total Bytes: 2

Product Units: deka-meters

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -127

Product Maximum: 1000

Description: The height from the reference ellipsoid of the ground as detected by the low resolution cloud processing algorithms. A value of -127 indicates that the ground was searched for, but not detected.

Comments:

Product Var Name i_spare3

Is element of: GLA09 Record

Short Description: Spares

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: NA

Invalid Value/Flag: N/A

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_MRcld_bot

Is element of: GLA09 Record

Short Description: Medium Resolution Cloud Bottom at 532 nm

Product Data Type: i2b (10, 4)

Total Bytes: 80

Product Units: deka-meters

Invalid Value/Flag: i_MRC_af

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100

Product Maximum: 2000

Description: Medium resolution height above the reference ellipsoid of the bottom of a cirrus, thin, or dense cloud layer in the atmosphere. There can be up to 10 cloud layers in an atmospheric profile. The medium resolution data occurs at the rate of once per second.

Comments:

Product Var Name i_MRcld_top

Is element of: GLA09 Record

Short Description: Medium Resolution Cloud Top at 532 nm

Product Data Type: i2b (10, 4)

Total Bytes: 80

Product Units: deka-meters

Invalid Value/Flag: i_MRC_af

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100

Product Maximum: 2000

Description: Medium resolution height above the reference ellipsoid of the top of a cirrus, thin, or dense cloud layer in the atmosphere. There can be up to 10 cloud layers in an atmospheric profile. The medium resolution data occurs at the rate of once per second.

Comments:

Product Var Name i_MRcld_grd

Is element of: GLA09 Record

Short Description: Medium Resolution Ground Detection at 532 nm

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: deka-meters

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -127

Product Maximum: 1000

Description: The height above the reference ellipsoid of the ground as detected by the medium resolution cloud processing algorithms. A value of -127 indicates that the ground was searched for, but not detected.

Comments:

Product Var Name i_MRcld_pct

Is element of: GLA09 Record

Short Description: Percentage of Saturated Bins in Medium Resolution Cloud Layers at 532 nm

Product Data Type: i1b (10, 4)

Total Bytes: 40

Product Units: unitless

Invalid Value/Flag: i_MRC_af

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 100

Description: Percentage of saturated bins in medium resolution cloud layers

Comments:

Product Var Name i_HRcld_bot

Is element of: GLA09 Record

Short Description: High Resolution Cloud Bottom at 532 nm

Product Data Type: i2b (10, 20)

Total Bytes: 400

Product Units: deka-meters

Invalid Value/Flag: i_HRC_af

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100

Product Maximum: 2000

Description: High resolution height above the reference ellipsoid of the bottom of a cirrus, thin, or dense cloud layer below 10KM in the atmosphere. There can be up to 10 cloud layers in an atmospheric profile. The high resolution data occurs at the rate of 5 per second.

Comments:

Product Var Name i_HRcld_top

Is element of: GLA09 Record

Short Description: High Resolution Cloud Top at 532 nm

Product Data Type: i2b (10, 20)

Total Bytes: 400

Product Units: deka-meters

Invalid Value/Flag: i_HRC_af

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100

Product Maximum: 2000

Description: High resolution height above the reference ellipsoid of the top of a cirrus, thin, or dense cloud layer below 10 KM in the atmosphere. There can be up to 10 cloud layers in an atmospheric profile. The high resolution data occurs at the rate of 5 per second.

Comments:

Product Var Name i_HRcld_grd

Is element of: GLA09 Record

Short Description: High Resolution Ground Detection at 532 nm

Product Data Type: i2b (20)

Total Bytes: 40

Product Units: deka-meters

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -127

Product Maximum: 1000

Description: The height above the reference ellipsoid of the ground as detected by the high resolution cloud processing algorithms. A value of -127 indicates that the ground was searched for, but not detected.

Comments:

Product Var Name i_FRcld_bot

Is element of: GLA09 Record

Short Description: Full Resolution Cloud Bottom at 532 nm

Product Data Type: i2b (160)

Total Bytes: 320

Product Units: deka-meters

Invalid Value/Flag: i_FRC_af

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100

Product Maximum: 400

Description: The height above the reference ellipsoid to the bottom of the full resolution cloud layer (40 Hz). This resolution cloud search is independent of the lower resolution cloud search results and is done for each 40 Hz shot regardless of whether or not clouds were detected at the lower resolutions. Note that the 40 Hz data is available only below 10 km, and thus clouds existing above that level cannot be detected at the 40 Hz resolution.

Comments:

Product Var Name i_FRcld_top

Is element of: GLA09 Record

Short Description: Full Resolution Cloud Top at 532 nm

Product Data Type: i2b (160)

Total Bytes: 320

Product Units: deka-meters

Invalid Value/Flag: i_FRC_af

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100

Product Maximum: 400

Description: The height above the reference ellipsoid to the top of the full resolution cloud layer (40 Hz). This resolution cloud search is independent of the lower resolution cloud search results and is done for each 40 Hz shot regardless of whether or not clouds were detected at the lower resolutions. Note that the 40 Hz data is available only below 10 km, and thus clouds existing above that level cannot be detected at the 40 Hz resolution.

Comments:

Product Var Name i_FRcld_grd

Is element of: GLA09 Record

Short Description: Full Resolution Cloud Ground Detection at 532 nm

Product Data Type: i2b (160)

Total Bytes: 320

Product Units: deka-meters

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -127

Product Maximum: 1000

Description: The height above the reference ellipsoid of the ground as detected by the full resolution cloud processing algorithms. A value of -127 indicates that the ground was searched for, but not detected.

Comments:

Product Var Name i_FRg_grd_sig

Is element of: GLA09 Record

Short Description: Full Resolution Ground Return Signal at 532 nm

Product Data Type: i4b (160)

Total Bytes: 640

Product Units: e9/(m-sr)

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 10000

Product Maximum: 10000000

Description: Ground return signal from the 532 nm backscatter profile at the height that the ground return is detected.

Comments:

Product Var Name i_FRir_grd_sig

Is element of: GLA09 Record

Short Description: Full Resolution Ground Return Signal at 1064 nm

Product Data Type: i4b (160)

Total Bytes: 640

Product Units: e9/(m-sr)

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 100000

Product Maximum: 10000000

Description: Ground return signal from the 1064 nm backscatter profile at the height that the ground return is detected.

Comments:

Product Var Name i_LRCL_Flag

Is element of: GLA09 Record
Short Description: Low Resolution Cloud Layers Flag for 532 nm
Product Data Type: i1b (11)
Total Bytes: 11
Product Units: NA
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 15
Description: Composite Flag - see Breakout for details
Please see <a href='flags/i_LRCL_Flag.pdf'> the PDF flag description in the next section for more details.
Comments:

Product Var Name i_MRCL_Flag
Is element of: GLA09 Record
Short Description: Medium Resolution Cloud Layers Flag for 532 nm
Product Data Type: i1b (37)
Total Bytes: 37
Product Units: NA
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 15
Description: Composite Flag - see Breakout for details
Please see <a href='flags/i_MRCL_Flag.pdf'> the PDF flag description in the next section for more details.
Comments:

Product Var Name i_HRCL_Flag
Is element of: GLA09 Record
Short Description: High Resolution Cloud Layers Flag for 532 nm
Product Data Type: i1b (185)
Total Bytes: 185
Product Units: NA
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 15

Description: Composite Flag - see Breakout for details

Please see <a href='flags/i_HRCL_Flag.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_FRCL_Flag

Is element of: GLA09 Record

Short Description: Full Resolution Cloud Layers Flag for 532 nm

Product Data Type: i1b (220)

Total Bytes: 220

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 15

Description: Composite Flag - see Breakout for details

Please see <a href='flags/i_FRCL_Flag.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_AttFlg3

Is element of: GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Attitude Flag 3

Product Data Type: i1b

Total Bytes: 1

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1

Description: Please see <a href='flags/i_AttFlg3.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_timecorflg

Is element of: GLA01 Main Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: time correction flag

Product Data Type: i2b

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: Indicates what instrument or bias corrections were applied to the times on this record. Please see <a href='flags/i_timecorflg.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_FRir_cldtop

Is element of: GLA09 Record

Short Description: Full Resolution 1064 Cloud Top

Product Data Type: i2b (160)

Total Bytes: 320

Product Units: deka-meters

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1030

Description: Full resolution (40 Hz) cloud top height obtained from the 1064 atmospheric channel. This parameter is for a 4 second record. Also parameter is in GLA06, 12-15.

Comments:

Product Var Name i_FRir_qaFlag

Is element of: GLA09 Record

Short Description: Full Resolution 1064 Quality Flag

Product Data Type: i1b (160)

Total Bytes: 160

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 15

Description: Please see <a href='flags/i_FRir_qaFlag.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_FRir_intsig

Is element of: GLA09 Record

Short Description: Full Resolution 1064 Integrated Signal

Product Data Type: i2b (160)

Total Bytes: 320

Product Units: e7/(m-sr)

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 10000

Description: Though called 'integrated signal' this is actually an average of all bins in the above-ground portion of the 1064 40 Hz profile with values above the threshold of 1.0e-7 (1/(m-sr). This parameter is for a 4 second record. This parameter is also in GLA06, 12-15.

Comments:

Product Var Name i_SolarAngle

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Solar Angle

Product Data Type: i4b (4)

Total Bytes: 16

Product Units: micro-degrees

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -90000000

Product Maximum: 90000000

Description: Solar Angle above or below the plane tangent to the ellipsoid surface at the laser spot. Positive values mean the sun is above the horizon, while negative values mean it is below the horizon. The effect of atmospheric refraction is not included. This is a low-precision value, with approximately one degree accuracy.

Comments:

Product Var Name i_LRir_cld_top

Is element of: GLA09 Record

Short Description: Elevation of Top of Cloud Layers Detected in 1064 nm at Low Resolution

Product Data Type: i2b (10)

Total Bytes: 20

Product Units: deka-meters

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100

Product Maximum: 2200

Description: Elevation of top of cloud layers detected in 1064 nm at low resolution data rate (1 per 4 sec).
Comments:

Product Var Name i_LRir_cld_bot
Is element of: GLA09 Record
Short Description: Elevation of Bottom of Cloud Layers Detected in 1064 nm at Low Resolution
Product Data Type: i2b (10)
Total Bytes: 20
Product Units: deka-meters
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -100
Product Maximum: 2200
Description: Elevation of Bottom of Cloud Layers Detected in 1064 nm at Low Resolution data rate (1 per 4 sec).
Comments:

Product Var Name i_LRir_QAflag
Is element of: GLA09 Record
Short Description: Low Resolution 1064 nm Cloud Layer QA Flag
Product Data Type: i1b (10)
Total Bytes: 10
Product Units: NA
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 256
Description: Low Resolution 1064 nm Cloud Layer QA Flag. Composite Flag - see Breakout for details
Please see <a href='flags/i_LRir_QAflag.pdf'> the PDF flag description in the next section for more details.

The data is arranged in 10 bytes. Within the 10 bytes:
bytes 1-4 are spares
byte 5 leaves bits 4-7 as spare, and stores the af availability flag in
bits 0-3; it provides the number of cloud layers determined
from 1064 nm data, with 0=layers searched for but not
detected and 15=cloud layers not searched for
bytes 6-10 are 10 flags, each 4 bits in length giving a quality flag;
15=cloud layers were not searched for, 0=cloud layers searched
for but not detected, 1= low chance of being a cloud,

2=moderate, 3=high, 4=no doubt
Comments:

Product Var Name i_LRir_cldtop_temp
Is element of: GLA09 Record
Short Description: Temperature of Top of Cloud Layers Detected in 1064 nm at Low Resolution
Product Data Type: i2b (10)
Total Bytes: 20
Product Units: degrees Celsius * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -10000
Product Maximum: 10000
Description: Temperature of Top of Cloud Layers Detected in 1064 nm at Low Resolution data rate (1 per 4 sec).
Comments:

Product Var Name i_LRir_cldtop_pres
Is element of: GLA09 Record
Short Description: Pressure of Top of Cloud Layers Detected in 1064 nm at Low Resolution
Product Data Type: i2b (10)
Total Bytes: 20
Product Units: hPa * 10
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 20000
Description: Pressure of Top of Cloud Layers Detected in 1064 nm at Low Resolution data rate (1 per 4 sec).
Comments:

Product Var Name i_LRir_cldtop_relh
Is element of: GLA09 Record
Short Description: Relative Humidity of Top of Cloud Layers Detected in 1064 nm at Low Resolution
Product Data Type: i2b (10)
Total Bytes: 20
Product Units: percentage * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No

Product Minimum: 0

Product Maximum: 10000

Description: Relative Humidity of Top of Cloud Layers Detected in 1064 nm at Low Resolution data rate (1 per 4 sec).

Comments:

Product Var Name i_LRir_cldbot_temp

Is element of: GLA09 Record

Short Description: Temperature of Bottom of Cloud Layers Detected in 1064 nm at Low Resolution

Product Data Type: i2b (10)

Total Bytes: 20

Product Units: degrees Celsius * 100

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -10000

Product Maximum: 10000

Description: Temperature of Bottom of Cloud Layers Detected in 1064 nm at Low Resolution data rate (1 per 4 sec).

Comments:

Product Var Name i_LRir_cldbot_pres

Is element of: GLA09 Record

Short Description: Pressure of Bottom of Cloud Layers Detected in 1064 nm at Low Resolution

Product Data Type: i2b (10)

Total Bytes: 20

Product Units: hPa * 10

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 20000

Description: Pressure of Bottom of Cloud Layers Detected in 1064 nm at Low Resolution data rate (1 per 4 sec).

Comments:

Product Var Name i_LRir_cldbot_relh

Is element of: GLA09 Record

Short Description: Relative Humidity of Bottom of Cloud Layers Detected in 1064 nm Low Resolution

Product Data Type: i2b (10)

Total Bytes: 20

Product Units: percentage * 100

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 10000

Description: Relative Humidity of Bottom of Cloud Layers Detected in 1064 nm Low Resolution data rate (1 per 4 sec).

Comments:

Product Var Name i_MRir_cld_top

Is element of: GLA09 Record, GLA11 Record

Short Description: Elevation of Top of Cloud Layers Detected in 1064 nm at Medium Resolution

Product Data Type: i2b (10, 4)

Total Bytes: 80

Product Units: deka-meters

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100

Product Maximum: 2200

Description: Elevation of Top of Cloud Layers Detected in 1064 nm at Medium Resolution data rate.

Comments:

Product Var Name i_MRir_cld_bot

Is element of: GLA09 Record, GLA11 Record

Short Description: Elevation of Bottom of Cloud Layers Detected in 1064 nm at Medium Resolution

Product Data Type: i2b (10, 4)

Total Bytes: 80

Product Units: deka-meters

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100

Product Maximum: 2200

Description: Elevation of Bottom of Cloud Layers Detected in 1064 nm at Medium Resolution data rate.

Comments:

Product Var Name i_MRir_QAflag

Is element of: GLA09 Record, GLA11 Record

Short Description: Medium Resolution 1064 nm Cloud Layer QA Flag

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 20000

Description: Medium Resolution 1064 nm Cloud Layer QA Flag. Composite Flag - see Breakout for details

Please see <a href='flags/i_MRir_QAflag.pdf'> the PDF flag description in the next section for more details.

The data is arranged in 40 bytes.

bytes 1-18 are spares:

bytes 19-20 are af flags: The 4 'af' flags (4 bits each) are concatenated with the QAflag storage and are contained in bytes 19-20 starting at bit 0 of byte 20.

bytes 21-40 are QAflags: The QAflag portion has been stored such that interval 1 is in bytes 40-36, interval 2 in bytes 35-31, interval 3 in bytes 30-26, and interval 4 in bytes 25-21. Each of the 10 layer flags per interval is 4 bits in length as before, such that interval 1 layer 1 is in bits 0-3 and interval 1 layer 2 is in bits 4-7 of byte 40, interval 1 layer 3 is in bits 0-3 and interval 1 layer 4 is in bits 4-7 of byte 39, etc.

Quality flag value 15=cloud layers were not searched for; 0=cloud layers were searched but not detected; 1-14 indicate increasing confidence of good cloud retrieval (value 1=least confidence, value 14=greatest confidence).

Availability flag value 15=cloud layers not searched for; 0=layers searched for but not detected.

Comments:

Product Var Name i_MRir_cldtop_temp

Is element of: GLA09 Record, GLA11 Record

Short Description: Temperature of Top of Cloud Layers Detected in 1064 nm at Medium Resolution

Product Data Type: i2b (10, 4)

Total Bytes: 80

Product Units: degrees Celsius * 100

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -10000

Product Maximum: 10000

Description: Temperature of Top of Cloud Layers Detected in 1064 nm at Medium Resolution data rate.

Comments:

Product Var Name i_MRir_cldtop_pres

Is element of: GLA09 Record, GLA11 Record

Short Description: Pressure of Top of Cloud Layers Detected in 1064 nm at Medium Resolution

Product Data Type: i2b (10, 4)

Total Bytes: 80
Product Units: hPa * 10
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 20000
Description: Pressure of Top of Cloud Layers Detected in 1064 nm at Medium Resolution data rate.
Comments:

Product Var Name i_MRir_cldtop_relh
Is element of: GLA09 Record, GLA11 Record
Short Description: Relative Humidity of Top of Cloud Layers in 1064 nm at Medium Resolution
Product Data Type: i2b (10, 4)
Total Bytes: 80
Product Units: percentage * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 10000
Description: Relative Humidity of Top of Cloud Layers in 1064 nm at Medium Resolution data rate.
Comments:

Product Var Name i_MRir_cldbot_temp
Is element of: GLA09 Record, GLA11 Record
Short Description: Temperature of Bottom of Cloud Layers Detected in 1064 nm at Medium Resolution
Product Data Type: i2b (10, 4)
Total Bytes: 80
Product Units: degrees Celsius * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -10000
Product Maximum: 10000
Description: Temperature of Bottom of Cloud Layers Detected in 1064 nm at Medium Resolution data rate.
Comments:

Product Var Name i_MRir_cldbot_pres
Is element of: GLA09 Record, GLA11 Record

Short Description: Pressure of Bottom of Cloud Layers Detected in 1064 nm at Medium Resolution
Product Data Type: i2b (10, 4)
Total Bytes: 80
Product Units: hPa * 10
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 20000
Description: Pressure of Bottom of Cloud Layers Detected in 1064 nm at Medium Resolution data rate.
Comments:

Product Var Name i_MRir_cldbot_relh
Is element of: GLA09 Record, GLA11 Record
Short Description: Relative Humidity of Bottom of Cloud Layers Detected in 1064 nm at MR
Product Data Type: i2b (10, 4)
Total Bytes: 80
Product Units: percentage * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 10000
Description: Relative Humidity of Bottom of Cloud Layers Detected in 1064 nm at Medium Resolution data rate.
Comments:

Product Var Name i_LRg_cldtop_temp
Is element of: GLA09 Record
Short Description: Low Resolution 532 nm Cloud Top Temperature
Product Data Type: i2b (10)
Total Bytes: 20
Product Units: degrees Celsius * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -10000
Product Maximum: 10000
Description: Low Resolution 532 nm Cloud Top Temperature
Comments:

Product Var Name i_LRg_cldtop_pres
Is element of: GLA09 Record
Short Description: Low Resolution 532 nm Cloud Top Pressure
Product Data Type: i2b (10)
Total Bytes: 20
Product Units: hPa * 10
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 20000
Description: Low Resolution 532 nm Cloud Top Pressure
Comments:

Product Var Name i_LRg_cldtop_relh
Is element of: GLA09 Record
Short Description: Low Resolution 532 nm Cloud Top Relative Humidity
Product Data Type: i2b (10)
Total Bytes: 20
Product Units: percentage * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 10000
Description: Low Resolution 532 nm Cloud Top Relative Humidity
Comments:

Product Var Name i_LRg_cldbot_temp
Is element of: GLA09 Record
Short Description: Low Resolution 532 nm Cloud Bottom Temperature
Product Data Type: i2b (10)
Total Bytes: 20
Product Units: degrees Celsius * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -10000
Product Maximum: 10000
Description: Low Resolution 532 nm Cloud Bottom Temperature

Comments:

Product Var Name i_LRg_cldbot_pres
Is element of: GLA09 Record
Short Description: Low Resolution 532 nm Cloud Bottom Pressure
Product Data Type: i2b (10)
Total Bytes: 20
Product Units: hPa * 10
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 20000
Description: Low Resolution 532 nm Cloud Bottom Pressure
Comments:

Product Var Name i_LRg_cldbot_relh
Is element of: GLA09 Record
Short Description: Low Resolution 532 nm Cloud Bottom Relative Humidity
Product Data Type: i2b (10)
Total Bytes: 20
Product Units: percentage * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 10000
Description: Low Resolution 532 nm Cloud Bottom Relative Humidity
Comments:

Product Var Name i_MRg_cldtop_temp
Is element of: GLA09 Record, GLA10 record, GLA11 Record
Short Description: Medium Resolution 532 nm Cloud Top Temperature
Product Data Type: i2b (10, 4)
Total Bytes: 80
Product Units: degrees Celsius * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -10000

Product Maximum: 10000
Description: Medium Resolution 532 nm Cloud Top Temperature
Comments:

Product Var Name i_MRg_cldtop_pres
Is element of: GLA09 Record, GLA10 record, GLA11 Record
Short Description: Medium Resolution 532 nm Cloud Top Pressure
Product Data Type: i2b (10, 4)
Total Bytes: 80
Product Units: hPa * 10
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 20000
Description: Medium Resolution 532 nm Cloud Top Pressure
Comments:

Product Var Name i_MRg_cldtop_relh
Is element of: GLA09 Record, GLA10 record, GLA11 Record
Short Description: Medium Resolution 532 nm Cloud Top Relative Humidity
Product Data Type: i2b (10, 4)
Total Bytes: 80
Product Units: percentage * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 10000
Description: Medium Resolution 532 nm Cloud Top Relative Humidity
Comments:

Product Var Name i_MRg_cldbot_temp
Is element of: GLA09 Record, GLA10 record, GLA11 Record
Short Description: Medium Resolution 532 nm Cloud Bottom Temperature
Product Data Type: i2b (10, 4)
Total Bytes: 80
Product Units: degrees Celsius * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA

Is Unsigned?: No
Product Minimum: -10000
Product Maximum: 10000
Description: Medium Resolution 532 nm Cloud Bottom Temperature
Comments:

Product Var Name i_MRg_cldbot_pres
Is element of: GLA09 Record, GLA10 record, GLA11 Record
Short Description: Medium Resolution 532 nm Cloud Bottom Pressure
Product Data Type: i2b (10, 4)
Total Bytes: 80
Product Units: hPa * 10
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 20000
Description: Medium Resolution 532 nm Cloud Bottom Pressure
Comments:

Product Var Name i_MRg_cldbot_relh
Is element of: GLA09 Record, GLA10 record, GLA11 Record
Short Description: Medium Resolution 532 nm Cloud Bottom Relative Humidity
Product Data Type: i2b (10, 4)
Total Bytes: 80
Product Units: percentage * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 10000
Description: Medium Resolution 532 nm Cloud Bottom Relative Humidity
Comments:

Product Var Name i_LRg_SourceFt
Is element of: GLA09 Record
Short Description: Low Resolution Data 532 nm Source Function
Product Data Type: i2b
Total Bytes: 2
Product Units: Unknown

Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 0
Description: Low Resolution Data 532 nm Source Function
Comments:

Product Var Name i_MRg_SourceFt
Is element of: GLA09 Record
Short Description: Medium Resolution Data 532 nm Source Function
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: Unknown
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 0
Description: Medium Resolution Data 532 nm Source Function
Comments:

Product Var Name i_HRg_SourceFt
Is element of: GLA09 Record
Short Description: High Resolution Data 532 nm Source Function
Product Data Type: i2b (20)
Total Bytes: 40
Product Units: Unknown
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 0
Description: High Resolution Data 532 nm Source Function
Comments:

Product Var Name i_LRir_SourceFt
Is element of: GLA09 Record
Short Description: Low Resolution Data 1064 nm Source Function
Product Data Type: i2b

Total Bytes: 2
Product Units: Unknown
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 0
Description: Low Resolution Data 1064 nm Source Function
Comments:

Product Var Name i_MRir_SourceFt
Is element of: GLA09 Record
Short Description: Medium Resolution Data 1064 nm Source Function
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: Unknown
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 0
Description: Medium Resolution Data 1064 nm Source Function
Comments:

Product Var Name i_Surface_temp
Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record
Short Description: Surface Temperature
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: degrees Celsius * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -10000
Product Maximum: 10000
Description: Surface Temperature, 4 of 1-second intervals.
Comments:

Product Var Name i_Surface_pres
Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Surface Pressure

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: hPa * 10

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 20000

Description: Surface Pressure, 4 of 1-second intervals.

Comments:

Product Var Name i_Surface_relh

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Surface Relative Humidity

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: percentage * 100

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 10000

Description: Surface Relative Humidity, 4 of 1-second intervals.

Comments:

Product Var Name i_Surface_wind

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Surface Wind Speed

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: meters/second * 100

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 20000

Description: Surface Wind Speed, 4 of 1-second intervals. Wind speed at Earth's surface level measured in km/hour and derived from the meteorological data files.

Comments:

Product Var Name i_Surface_wdir

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Surface Wind Direction Azimuth from North

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: degrees * 10

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 3600

Description: Surface wind direction azimuth from North, 4 of 1-second intervals. Wind direction at Earth's surface level measured in degrees of azimuth from North and derived from the meteorological data files.

Comments:

Product Var Name i_PBL_Layer_ht

Is element of: GLA08 Record, GLA09 Record

Short Description: PBL Layer Height from Met Data

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: deka-meters

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100

Product Maximum: 1000

Description:

Comments:

Product Var Name i_Spec_Humid

Is element of: GLA08 Record, GLA09 Record

Short Description: Specific Humidity

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: gram/kilogram*100

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1000

Description: Specific humidity 2m above ground.Comments:

Product Var Name i_Temp2mAbvGrnd
Is element of: GLA08 Record, GLA09 Record
Short Description: Temperature 2m Above Ground Level
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: degrees Celsius * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -10000
Product Maximum: 10000
Description:
Comments:

Product Var Name i_Total_CloudCov
Is element of: GLA08 Record, GLA09 Record
Short Description: Total Cloud Cover
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: percentage
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 100
Description:
Comments:

Product Var Name i_blow_snow_ht
Is element of: GLA09 Record
Short Description: Blowing Snow Height
Product Data Type: i2b (20)
Total Bytes: 40
Product Units: meters * 10
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 255

Description: Represents the maximum height above the surface of the blowing snow layer.
Comments:

Product Var Name i_blow_snow_od
Is element of: GLA09 Record
Short Description: Blowing Snow Optical Depth
Product Data Type: i2b (20)
Total Bytes: 40
Product Units: unitless * 1000
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: NA
Product Minimum: 0
Product Maximum: 255
Description: An estimate of the optical depth of the blowing snow layer.
Comments:

Product Var Name i_blow_snow_erd
Is element of: GLA09 Record
Short Description: Blowing Snow Range Delay
Product Data Type: i2b (20)
Total Bytes: 40
Product Units: millimeters * 10
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: NA
Product Minimum: 0
Product Maximum: 255
Description: An estimate of the range delay caused by blowing snow.
Comments:

Product Var Name i_blow_snow_conf
Is element of: GLA09 Record
Short Description: Blowing Snow Confidence
Product Data Type: i1b (20)
Total Bytes: 20
Product Units: NA
Invalid Value/Flag: N/A
Is Correction Flag?: NA
Is Unsigned?: NA

Product Minimum: 0

Product Maximum: 15

Description: A number that indicates the degree of confidence that this is indeed blowing snow. Blowing snow confidence ranges from 0 - 15 and has the following meanings:

0: profile tested, but no blowing snow detected

1 - 5: Good blowing snow detection using the 1064 channel. 1 is lowest confidence that layer is blowing snow, 5 is highest confidence.

6: Layer suspected of being low cloud (such as fog), or seemingly too thick to be blowing snow (> 1.0 km thick) as determined from 1064 channel.

7 - 12: Good blowing snow detection using the 532 channel. 7 is lowest confidence that layer is blowing snow, 12 is highest confidence.

13: Layer suspected of being low cloud (such as fog), or seemingly too thick to be blowing snow (> 1.0 km thick) as determined from 532 channel.

14: Wind speed < 5 m/s or ground stroke not detected (the latter case indicating overlying thick cloud)

15: Signal not examined for blowing snow (could be because it is closer to the equator than plus or minus 60 degrees latitude, or not over sea ice or land)

Comments:

Product Var Name i_atm_char_flag

Is element of: GLA09 Record

Short Description: Atmosphere Characterization Flag

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: N/A

Invalid Value/Flag: N/A

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 10

Description: Flag to characterize cloud and blowing snow state of the atmosphere

0 clear

1 high cloud (> 5 km) low optical depth

2 high cloud (> 5 km), high optical depth

3 mid cloud (>2, <=5 km) low optical depth

4 mid cloud (>2, <=5 km) high optical depth

5 low cloud (> 500 m, <=2 km), low optical depth

6 low cloud (> 500 m, <=2 km), high optical depth

7 blowing snow or fog (< 500 m), low optical depth

8 blowing snow or fog (< 500 m), high optical depth

9 not tested

10 data quality insufficient to assign flag

Comments:

Product Var Name i_atm_char_conf

Is element of: GLA09 Record

Short Description: Atmosphere Characterization Flag Confidence

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: N/A

Invalid Value/Flag: N/A

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 3

Description: Confidence level ascribed to the atmosphere characterization flag

Comments: 0 Not applicable (for contamination flag values of 9 or 10)

1 low confidence

2 reasonable confidence

3 high confidence

Product Var Name i_spare4

Is element of: GLA09 Record

Short Description: Spare 4

Product Data Type: i1b (402)

Total Bytes: 402

Product Units: NA

Invalid Value/Flag: N/A

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: GLA09 Spare4

Product Var Name i_rec_ndx

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: GLAS Record Index

Product Data Type: i4b

Total Bytes: 4

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: Unique index that relates this record to the corresponding record(s) in each GLAS data product.

Comments:

Product Var Name i_UTCTime

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Transmit Time of First Shot in frame in J2000

Product Data Type: i4b (2)

Total Bytes: 8

Product Units: seconds, microseconds

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: The transmit time of the first shot in the 1 second frame measured as 'UTC seconds' elapsed since Jan 1 2000 12:00:00 UTC. This time has been derived from the GPS time accounting for leap seconds. The first item is the whole number of seconds; the second item is the fractional part in microseconds.

Comments: This is not the ground bounce time, but the transmit time.

Product Var Name i_beam_coelev

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Co-elevation

Product Data Type: i4b (4)

Total Bytes: 16

Product Units: degrees*100

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 36000

Description: Co-elevation (CE) is direction from vertical of the laser beam as seen by an observer located at the laser ground spot.

Comments:

Product Var Name i_beam_azimuth

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Azimuth

Product Data Type: i4b (4)

Total Bytes: 16

Product Units: degrees*100

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 36000

Description: Azimuth (Az) is the direction clockwise from north of the laser beam as seen by an observer at the laser ground spot.

Comments:

Product Var Name i_pad_angle

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: PAD Angle

Product Data Type: i4b (4)

Total Bytes: 16

Product Units: microdegrees

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 3600000000

Description: Attitude angle calculated from PAD and POD.

Comments:

Product Var Name i_spare0

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Spares 0

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: null

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_AttFlg1

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Attitude flag

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: Composite Flag - see Common Flag Spreadsheet for details

Please see <a href='flags/i_AttFlg1.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_lat

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Profile Location, Latitude

Product Data Type: i4b (4)

Total Bytes: 16

Product Units: microdegrees

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -90000000

Product Maximum: 90000000

Description: Profile coordinate in the IERS Terrestrial Reference Frame: east longitude and latitude, at the 1 hertz rate.

Comments:

Product Var Name i_lon

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Profile Location, Longitude

Product Data Type: i4b (4)

Total Bytes: 16

Product Units: microdegrees

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 360000000

Description: Profile coordinate in the IERS Terrestrial Reference Frame: east longitude and latitude, at the 1 hertz rate.

Comments:

Product Var Name i_OrbFlg

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Orbit flag

Product Data Type: i1b (2, 4)

Total Bytes: 8

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 128

Description: Composite Flag - see Common Flag Spreadsheet for details

Please see <a href='flags/i_OrbFlg.pdf'> the PDF flag description in the next section for more details.

There are 4 sets of this flag value, 1/sec for each of the 4 sec covered in the record.

Comments:

Product Var Name i_surfType

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Region Type

Product Data Type: i1b (4)

Total Bytes: 4

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 1

Product Maximum: 15

Description: Describes the region type or types associated with each shot Ice Sheet, ocean, sea ice, or Land.

Please see <a href='flags/i_surfType.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_LidarQF

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Lidar Frame quality flag

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: Composite Flag - see Common Flag Spreadsheet for details

Please see <a href='flags/i_LidarQF.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_cld1_bs_prof

Is element of: GLA10 record

Short Description: Cloud Backscatter Cross Section Profile at 532 nm

Product Data Type: i4b (280, 4)

Total Bytes: 4480

Product Units: e10/(m-sr)

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -1000000

Product Maximum: 100000000

Description: 532 nm cloud backscatter cross section corrected for attenuation, from 20 to -1km at 1hz. The first 4*280 bytes refer to the profile at the first second.

Comments:

Product Var Name i_cld1_ext_prof

Is element of: GLA10 record

Short Description: Cloud Extinction Cross Section Profile at 532 nm

Product Data Type: i4b (280, 4)

Total Bytes: 4480

Product Units: e9/m

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -10000000

Product Maximum: 1000000000

Description: Cloud extinction cross section profile from 20 to -1km at 1hz calculated from the 532 nm data. The first 4*280 bytes refer to the profile at the first second.

Comments:

Product Var Name i_aer4_bs_prof

Is element of: GLA10 record

Short Description: Aerosol Backscatter Cross Section Profile at 532nm

Product Data Type: i4b (548)

Total Bytes: 2192

Product Units: e10/(m-sr)

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -1000000

Product Maximum: 100000000

Description: 532 nm aerosol backscatter cross section from 40 to -1km at 0.25hz. The 4*548 bytes refer to the profile at the four second interval.

Comments:

Product Var Name i_aer4_ext_prof

Is element of: GLA10 record

Short Description: Aerosol Extinction Cross Section Profile at 532 nm

Product Data Type: i4b (548)

Total Bytes: 2192

Product Units: e9/m

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -10000000

Product Maximum: 1000000000

Description: Aerosol extinction cross section profile for 40 to -1km calculated from the 532 nm data at 0.25hz. The 4*548 bytes refer to the profile at the four second interval.

Comments:

Product Var Name i_cld1_sval1

Is element of: GLA10 record

Short Description: Cloud true S values from table

Product Data Type: i2b (10, 4)

Total Bytes: 80

Product Units: 100*sr

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 100

Product Maximum: 20000

Description: Cloud true extinction to backscatter ratios calculated from meteorological and geographic data. The first set of 2*10 bytes refers to the 10 possible layers at the first second.

Comments:

Product Var Name i_cld1_sval2

Is element of: GLA10 record

Short Description: Cloud true S values from equation calc.

Product Data Type: i2b (10, 4)

Total Bytes: 80

Product Units: 100*sr

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 100

Product Maximum: 20000

Description: Cloud true extinction to backscatter ratios calculated from optically thin layer considerations. The first set of 2*10 bytes refers to the 10 possible layers at the first second.

Comments:

Product Var Name i_aer4_sval1

Is element of: GLA10 record

Short Description: Aerosol true S Values from table

Product Data Type: i2b (9)

Total Bytes: 18

Product Units: 100*sr

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 100

Product Maximum: 20000

Description: Aerosol true extinction to backscatter ratios calculated from meteorological and geographic data

Comments:

Product Var Name i_aer4_sval2

Is element of: GLA10 record

Short Description: Aerosol true S Values from equation calc.

Product Data Type: i2b (9)

Total Bytes: 18

Product Units: 100*sr

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 100

Product Maximum: 20000

Description: Aerosol true extinction to backscatter ratios calculated from optically thin layer considerations

Comments:

Product Var Name i_cld1_bot

Is element of: GLA10 record, GLA11 Record

Short Description: Medium Resolution Cloud Bottom at 532 nm

Product Data Type: i2b (10, 4)

Total Bytes: 80

Product Units: deka-meters

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100

Product Maximum: 2000

Description: Medium resolution cloud bottom heights for layers which were selected for optical processing at 1hz, 1 per layer, 10 layers

Comments:

Product Var Name i_cld1_top

Is element of: GLA10 record, GLA11 Record

Short Description: Medium Resolution Cloud Top at 532 nm

Product Data Type: i2b (10, 4)

Total Bytes: 80

Product Units: deka-meters

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100

Product Maximum: 2000

Description: Medium resolution cloud top heights for layers which were selected for optical processing at 1hz, 1 per layer, 10 layers

Comments:

Product Var Name i_cld1_grd_det

Is element of: GLA10 record, GLA11 Record

Short Description: Medium Resolution Ground Detection at 532 nm

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: deka-meters

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100

Product Maximum: 2000

Description: Medium resolution processed ground height at 1hz, 1 per profile

Comments:

Product Var Name i_aer4_bot

Is element of: GLA10 record

Short Description: Low Resolution Aerosol Layer Bottom at 532 nm

Product Data Type: i2b (9)

Total Bytes: 18

Product Units: deka-meters

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100

Product Maximum: 4000

Description: Low resolution aerosol layer bottom heights for layers which were selected for optical processing at 0.25hz, 1 per layer, 9 layers including the planetary boundary layer and PSC

Comments:

Product Var Name i_aer4_top

Is element of: GLA10 record

Short Description: Low Resolution Aerosol Layer Top at 532 nm

Product Data Type: i2b (9)

Total Bytes: 18

Product Units: deka-meters

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100

Product Maximum: 4000

Description: Low resolution aerosol layer top heights for layers which were selected for optical processing at 0.25hz, 1 per layer, 9 layers including the planetary boundary layer and PSC

Comments:

Product Var Name i_pbl4_grd_det

Is element of: GLA10 record

Short Description: Low Resolution Aerosol Layer Ground Detection

Product Data Type: i2b

Total Bytes: 2

Product Units: deka-meters

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100

Product Maximum: 1000

Description: Low resolution processed ground detection height at 0.25hz, 1 per profile

Comments:

Product Var Name i_spare2

Is element of: GLA10 record

Short Description: Spare 2

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: NA

Invalid Value/Flag: N/A

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: GLA10 spare2.

Product Var Name i_cld1_sval_uf

Is element of: GLA10 record

Short Description: Cloud true S values use flag

Product Data Type: i1b (20)

Total Bytes: 20

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 15

Description: Cloud true S values use flag for 10 layers at 1 Hz for 4 sec. First 40 bits (bytes 16-20) are for 10 layers of the first second, last 40 bits (bytes 1 - 5) are for 10 layers of the fourth second. Stipulates which extinction to backscatter ratio was used in processing (1=default, 2=calculated). 15 denotes no layer detected (invalid).

Please see <a href='flags/i_cld1_sval_uf.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_aer4_sval_uf

Is element of: GLA10 record, GLA11 Record

Short Description: Aerosol true S Values use flag

Product Data Type: i1b (5)

Total Bytes: 5

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 15

Description: Aerosol true S values use flag for 9 layers at 1 per 4 sec. Bits 0-3 (least significant bits) of byte 5 are for first layer, bits 0-3 of byte 1 are for 9th layer. 15 denotes no layer detected (invalid). Bits 36-39 are spares needed to make 5 bytes. Stipulates which extinction to backscatter ratio was used in processing (1=default, 2=calculated).

Please see <a href='flags/i_aer4_sval_uf.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_spare3

Is element of: GLA10 record

Short Description: Spares

Product Data Type: i1b (3)

Total Bytes: 3

Product Units: NA

Invalid Value/Flag: N/A

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_cld1_bs_flag

Is element of: GLA10 record

Short Description: Cloud backscatter flag for 532 nm
Product Data Type: i1b (40)
Total Bytes: 40
Product Units: NA
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 15
Description: Composite Flag - see Breakout for details
Please see <a href='flags/i_cld1_bs_flag.pdf'> the PDF flag description in the next section for more details.
Comments:

Product Var Name i_cld1_ext_flag
Is element of: GLA10 record
Short Description: Cloud extinction flag at 532 nm
Product Data Type: i1b (40)
Total Bytes: 40
Product Units: NA
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 15
Description: Composite Flag - see Breakout for details
Please see <a href='flags/i_cld1_ext_flag.pdf'> the PDF flag description in the next section for more details.
Comments:

Product Var Name i_aer4_bs_flag
Is element of: GLA10 record
Short Description: Aerosol backscatter flag for 532 nm
Product Data Type: i1b (10)
Total Bytes: 10
Product Units: NA
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 15
Description: Composite Flag - see Breakout for details

Please see <a href='flags/i_aer4_bs_flag.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_aer4_ext_flag

Is element of: GLA10 record

Short Description: Aerosol extinction flag for 532 nm

Product Data Type: i1b (10)

Total Bytes: 10

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 15

Description: Composite Flag - see Breakout for details

Please see <a href='flags/i_aer4_ext_flag.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_spare4

Is element of: GLA10 record

Short Description: Spare 4

Product Data Type: i1b

Total Bytes: 1

Product Units: null

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_AttFlg3

Is element of: GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Attitude Flag 3

Product Data Type: i1b

Total Bytes: 1

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1

Description: Please see <a href='flags/i_AttFlg3.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_timecorflg

Is element of: GLA01 Main Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: time correction flag

Product Data Type: i2b

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: Indicates what instrument or bias corrections were applied to the times on this record. Please see <a href='flags/i_timecorflg.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_SolarAngle

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Solar Angle

Product Data Type: i4b (4)

Total Bytes: 16

Product Units: micro-degrees

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -90000000

Product Maximum: 90000000

Description: Solar Angle above or below the plane tangent to the ellipsoid surface at the laser spot. Positive values mean the sun is above the horizon, while negative values mean it is below the horizon. The effect of atmospheric refraction is not included. This is a low-precision value, with approximately one degree accuracy.

Comments:

Product Var Name i_MRg_cldtop_temp

Is element of: GLA09 Record, GLA10 record, GLA11 Record

Short Description: Medium Resolution 532 nm Cloud Top Temperature
Product Data Type: i2b (10, 4)
Total Bytes: 80
Product Units: degrees Celsius * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -10000
Product Maximum: 10000
Description: Medium Resolution 532 nm Cloud Top Temperature
Comments:

Product Var Name i_MRg_cldtop_pres
Is element of: GLA09 Record, GLA10 record, GLA11 Record
Short Description: Medium Resolution 532 nm Cloud Top Pressure
Product Data Type: i2b (10, 4)
Total Bytes: 80
Product Units: hPa * 10
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 20000
Description: Medium Resolution 532 nm Cloud Top Pressure
Comments:

Product Var Name i_MRg_cldtop_relh
Is element of: GLA09 Record, GLA10 record, GLA11 Record
Short Description: Medium Resolution 532 nm Cloud Top Relative Humidity
Product Data Type: i2b (10, 4)
Total Bytes: 80
Product Units: percentage * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 10000
Description: Medium Resolution 532 nm Cloud Top Relative Humidity
Comments:

Product Var Name i_MRg_cldbot_temp
Is element of: GLA09 Record, GLA10 record, GLA11 Record
Short Description: Medium Resolution 532 nm Cloud Bottom Temperature
Product Data Type: i2b (10, 4)
Total Bytes: 80
Product Units: degrees Celsius * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -10000
Product Maximum: 10000
Description: Medium Resolution 532 nm Cloud Bottom Temperature
Comments:

Product Var Name i_MRg_cldbot_pres
Is element of: GLA09 Record, GLA10 record, GLA11 Record
Short Description: Medium Resolution 532 nm Cloud Bottom Pressure
Product Data Type: i2b (10, 4)
Total Bytes: 80
Product Units: hPa * 10
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 20000
Description: Medium Resolution 532 nm Cloud Bottom Pressure
Comments:

Product Var Name i_MRg_cldbot_relh
Is element of: GLA09 Record, GLA10 record, GLA11 Record
Short Description: Medium Resolution 532 nm Cloud Bottom Relative Humidity
Product Data Type: i2b (10, 4)
Total Bytes: 80
Product Units: percentage * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 10000
Description: Medium Resolution 532 nm Cloud Bottom Relative Humidity

Comments:

Product Var Name i_Aer_top_temp
Is element of: GLA10 record, GLA11 Record
Short Description: Aerosol Layers Temperature at Top of Layer at 532 nm
Product Data Type: i2b (9)
Total Bytes: 18
Product Units: degrees Celsius * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -10000
Product Maximum: 10000
Description: Aerosol Layers Temperature at Top of Layer at 532 nm
Comments:

Product Var Name i_Aer_top_pres
Is element of: GLA10 record, GLA11 Record
Short Description: Aerosol Layers Pressure at Top of Layer at 532 nm
Product Data Type: i2b (9)
Total Bytes: 18
Product Units: hPa * 10
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 20000
Description: Aerosol Layers Pressure at Top of Layer at 532 nm
Comments:

Product Var Name i_Aer_top_relh
Is element of: GLA10 record, GLA11 Record
Short Description: Aerosol Layers Relative Humidity at Top of Layer at 532 nm
Product Data Type: i2b (9)
Total Bytes: 18
Product Units: percentage * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0

Product Maximum: 10000
Description: Aerosol Layers Relative Humidity at Top of Layer at 532 nm
Comments:

Product Var Name i_Aer_bot_temp
Is element of: GLA10 record, GLA11 Record
Short Description: Aerosol Layers Temperature at Bottom of Layer at 532 nm
Product Data Type: i2b (9)
Total Bytes: 18
Product Units: degrees Celsius * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -10000
Product Maximum: 10000
Description: Aerosol Layers Temperature at Bottom of Layer at 532 nm
Comments:

Product Var Name i_Aer_bot_pres
Is element of: GLA10 record, GLA11 Record
Short Description: Aerosol Layers Pressure at Bottom of Layer at 532 nm
Product Data Type: i2b (9)
Total Bytes: 18
Product Units: hPa * 10
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 20000
Description: Aerosol Layers Pressure at Bottom of Layer at 532 nm
Comments:

Product Var Name i_Aer_bot_relh
Is element of: GLA10 record, GLA11 Record
Short Description: Aerosol Layers Relative Humidity at Bottom of Layer at 532 nm
Product Data Type: i2b (9)
Total Bytes: 18
Product Units: percentage * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA

Is Unsigned?: No
Product Minimum: 0
Product Maximum: 10000
Description: Aerosol Layers Relative Humidity at Bottom of Layer at 532 nm
Comments:

Product Var Name i_Surface_temp
Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record
Short Description: Surface Temperature
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: degrees Celsius * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -10000
Product Maximum: 10000
Description: Surface Temperature, 4 of 1-second intervals.
Comments:

Product Var Name i_Surface_pres
Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record
Short Description: Surface Pressure
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: hPa * 10
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 20000
Description: Surface Pressure, 4 of 1-second intervals.
Comments:

Product Var Name i_Surface_relh
Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record
Short Description: Surface Relative Humidity
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: percentage * 100

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 10000

Description: Surface Relative Humidity, 4 of 1-second intervals.

Comments:

Product Var Name i_Surface_wind

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Surface Wind Speed

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: meters/second * 100

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 20000

Description: Surface Wind Speed, 4 of 1-second intervals. Wind speed at Earth's surface level measured in km/hour and derived from the meteorological data files.

Comments:

Product Var Name i_Surface_wdir

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Surface Wind Direction Azimuth from North

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: degrees * 10

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 3600

Description: Surface wind direction azimuth from North, 4 of 1-second intervals. Wind direction at Earth's surface level measured in degrees of azimuth from North and derived from the meteorological data files.

Comments:

Product Var Name i_aod_botht_4s

Is element of: GLA10 record

Short Description: Cloud-free Trop. Height

Product Data Type: i2b

Total Bytes: 2

Product Units: deka-meters

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: NA

Product Minimum: -1000

Product Maximum: 40000

Description: Height of cloud-free troposphere (bottom of full column extinction profile).

Comments:

Product Var Name i_spare5

Is element of: GLA10 record

Short Description: Spare 5

Product Data Type: i1b (290)

Total Bytes: 290

Product Units: NA

Invalid Value/Flag: N/A

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: Spare5 GLA10

Product Var Name i_rec_ndx

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: GLAS Record Index

Product Data Type: i4b

Total Bytes: 4

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: Unique index that relates this record to the corresponding record(s) in each GLAS data product.

Comments:

Product Var Name i_UTCTime

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Transmit Time of First Shot in frame in J2000

Product Data Type: i4b (2)

Total Bytes: 8

Product Units: seconds, microseconds

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: The transmit time of the first shot in the 1 second frame measured as 'UTC seconds' elapsed since Jan 1 2000 12:00:00 UTC. This time has been derived from the GPS time accounting for leap seconds. The first item is the whole number of seconds; the second item is the fractional part in microseconds.

Comments: This is not the ground bounce time, but the transmit time.

Product Var Name i_beam_coelev

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Co-elevation

Product Data Type: i4b (4)

Total Bytes: 16

Product Units: degrees*100

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 36000

Description: Co-elevation (CE) is direction from vertical of the laser beam as seen by an observer located at the laser ground spot.

Comments:

Product Var Name i_beam_azimuth

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Azimuth

Product Data Type: i4b (4)

Total Bytes: 16

Product Units: degrees*100

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 36000

Description: Azimuth (Az) is the direction clockwise from north of the laser beam as seen by an observer at the laser ground spot.

Comments:

Product Var Name i_pad_angle

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: PAD Angle

Product Data Type: i4b (4)

Total Bytes: 16

Product Units: microdegrees

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 3600000000

Description: Attitude angle calculated from PAD and POD.

Comments:

Product Var Name i_spare0

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Spares 0

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: null

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_AttFlg1

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Attitude flag

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: Composite Flag - see Common Flag Spreadsheet for details

Please see <a href='flags/i_AttFlg1.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_lat

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Profile Location, Latitude

Product Data Type: i4b (4)

Total Bytes: 16

Product Units: microdegrees

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -90000000

Product Maximum: 90000000

Description: Profile coordinate in the IERS Terrestrial Reference Frame: east longitude and latitude, at the 1 hertz rate.

Comments:

Product Var Name i_lon

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Profile Location, Longitude

Product Data Type: i4b (4)

Total Bytes: 16

Product Units: microdegrees

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 360000000

Description: Profile coordinate in the IERS Terrestrial Reference Frame: east longitude and latitude, at the 1 hertz rate.

Comments:

Product Var Name i_OrbFlg
Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record
Short Description: Orbit flag
Product Data Type: i1b (2, 4)
Total Bytes: 8
Product Units: NA
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 128
Description: Composite Flag - see Common Flag Spreadsheet for details
Please see <a href='flags/i_OrbFlg.pdf'> the PDF flag description in the next section for more details.
There are 4 sets of this flag value, 1/sec for each of the 4 sec covered in the record.
Comments:

Product Var Name i_surfType
Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record
Short Description: Region Type
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: NA
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 1
Product Maximum: 15
Description: Describes the region type or types associated with each shot Ice Sheet, ocean, sea ice, or Land.
Please see <a href='flags/i_surfType.pdf'> the PDF flag description in the next section for more details.
Comments:

Product Var Name i_LidarQF
Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record
Short Description: Lidar Frame quality flag
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: NA
Invalid Value/Flag: No
Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: Composite Flag - see Common Flag Spreadsheet for details

Please see <a href='flags/i_LidarQF.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_cld1_od

Is element of: GLA11 Record

Short Description: Cloud Optical Depth at 532 nm

Product Data Type: i2b (10, 4)

Total Bytes: 80

Product Units: unitless*1000

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 5000

Description: 532 nm cloud optical depth, corrected for multiple scattering, at 1hz, 1 per layer, 10 layers

Comments:

Product Var Name i_aer4_od

Is element of: GLA11 Record

Short Description: Aerosol Optical Depth at 532 nm

Product Data Type: i2b (8)

Total Bytes: 16

Product Units: unitless*1000

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 5000

Description: 532 nm elevated aerosol optical depth, corrected for multiple scattering, at 0.25hz, 1 per layer, 8 layers

Comments:

Product Var Name i_pbl4_od

Is element of: GLA11 Record

Short Description: PBL Optical Depth at 532 nm

Product Data Type: i2b

Total Bytes: 2

Product Units: unitless*1000

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 5000

Description: 532 nm Planetary Boundary Layer aerosol optical depth, corrected for multiple scattering at 0.25hz, 1 per layer, 1 layer

Comments:

Product Var Name i_aer4_msf

Is element of: GLA11 Record

Short Description: Aerosol Multiple Scattering Factor

Product Data Type: i2b (9)

Total Bytes: 18

Product Units: unitless

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1000

Description: Aerosol multiple scattering coefficient used at 0.25hz, 1 per layer, 9 layers (including PSC and PBL)

Comments:

Product Var Name i_cld1_msf

Is element of: GLA11 Record

Short Description: Cloud Multiple Scattering Factor

Product Data Type: i2b (10, 4)

Total Bytes: 80

Product Units: unitless

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1000

Description: Cloud multiple scattering coefficient at 1 hz, 1 per layer, 10 layers

Comments:

Product Var Name i_cld1_bot

Is element of: GLA10 record, GLA11 Record

Short Description: Medium Resolution Cloud Bottom at 532 nm

Product Data Type: i2b (10, 4)

Total Bytes: 80

Product Units: deka-meters

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100

Product Maximum: 2000

Description: Medium resolution cloud bottom heights for layers which were selected for optical processing at 1hz, 1 per layer, 10 layers

Comments:

Product Var Name i_cld1_top

Is element of: GLA10 record, GLA11 Record

Short Description: Medium Resolution Cloud Top at 532 nm

Product Data Type: i2b (10, 4)

Total Bytes: 80

Product Units: deka-meters

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100

Product Maximum: 2000

Description: Medium resolution cloud top heights for layers which were selected for optical processing at 1hz, 1 per layer, 10 layers

Comments:

Product Var Name i_cld1_grd_det

Is element of: GLA10 record, GLA11 Record

Short Description: Medium Resolution Ground Detection at 532 nm

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: deka-meters

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100

Product Maximum: 2000

Description: Medium resolution processed ground height at 1hz, 1 per profile

Comments:

Product Var Name i_aer4_bot

Is element of: GLA11 Record

Short Description: Low Resolution Aerosol Layer Bottom at 532 nm

Product Data Type: i2b (8)

Total Bytes: 16

Product Units: deka-meters

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100

Product Maximum: 4000

Description: Low resolution elevated aerosol layer (including PSC) bottom height for layers which were selected for optical processing at 0.25hz, 1 per layer, 8 layers

Comments:

Product Var Name i_aer4_top

Is element of: GLA11 Record

Short Description: Low Resolution Aerosol Layer Top at 532 nm

Product Data Type: i2b (8)

Total Bytes: 16

Product Units: deka-meters

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100

Product Maximum: 4000

Description: Low resolution elevated aerosol layer (including PSC) top height for layers which were selected for optical processing at 0.25hz, 1 per layer, 8 layers

Comments:

Product Var Name i_aer4_ht

Is element of: GLA11 Record

Short Description: Low Resolution PBL Height at 532 nm

Product Data Type: i2b

Total Bytes: 2

Product Units: deka-meters

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100

Product Maximum: 700

Description: Low resolution Planetary Boundary Layer height at 0.25hz, 1 per profile

Comments:

Product Var Name i_aer4_grd_det

Is element of: GLA11 Record

Short Description: Low Resolution Ground Detection at 532 nm

Product Data Type: i2b

Total Bytes: 2

Product Units: deka-meters

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -100

Product Maximum: 1000

Description: Low resolution processed ground detection height at 0.25hz, 1 per profile

Comments:

Product Var Name i_erd

Is element of: GLA11 Record

Short Description: Estimated Range Delay

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: millimeters

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1000

Description: The estimated range delay is an estimate of the effect of atmospheric multiple scattering on the measured range as deduced from the surface pulse. Tables were created using the Monte Carlo method which contain the range delay as a function of height of scatting layer, geometrical thickness, optical thickness and particle size. The i_erd is provided to the elevation process as a range correction and is reported as a negative number that can be added to the range to correct it. The computation of i_erd is restricted to those times when the 532 channel was working sufficiently well (L2A and first half of L2B (also possibly for night L3A and L3B)).

Comments:

Product Var Name i_pse

Is element of: GLA11 Record

Short Description: Particle Size Estimate

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: microns

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1000

Description: Particle size estimate used to calculate warning flag and range delay, 1 per second

Comments:

Product Var Name i_cld1_mswf

Is element of: GLA11 Record

Short Description: Cloud Multiple Scattering Warning Flag

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 15

Description: Cloud Multiple Scattering Warning Flag at 1 Hz for 4 sec. First 4 bits are for first second, last 4 bits are for 4th second.

Please see <a href='flags/i_cld1_mswf.pdf'> the PDF flag description in the next section for more details.

The multiple scattering warning flag (MSWF) is based on the total column optical depth (aerosol plus cloud) calculated in GLA11 using 532nm. It is intended as a way to quickly obtain information about the potential severity of multiple scattering with regards to the range-to-surface calculated by the altimetry processing software. It will be output on the GLA11 product for use by the altimetry group. The multiple scattering warning flag will have values ranging from 0-14, based on the total column optical depth as detailed in the PDF.

A warning flag value of 15 will signify ?invalid?. An invalid will be encoded if an optical depth in any of the layers in the 1-second column could not be calculated. This usually occurs in a very optically ?thick? cloud which extinguishes the signal. It could also occur if the extinction-to-backscatter ratio assignment is set too high, causing the transmission calculations in the lidar inversion to go out-of-range.

Comments:

Product Var Name i_cld1_flag

Is element of: GLA11 Record

Short Description: Cloud optical depth flag for 532 nm

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 15
Description: Composite Flag - see Breakout for details
Please see <a href='flags/i_cld1_flag.pdf'> the PDF flag description in the next section for more details.
Comments:

Product Var Name i_aer4_flag
Is element of: GLA11 Record
Short Description: Aerosol optical depth flag for 532 nm
Product Data Type: i1b (8)
Total Bytes: 8
Product Units: NA
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 15
Description: Composite Flag - see Breakout for details
Please see <a href='flags/i_aer4_flag.pdf'> the PDF flag description in the next section for more details.
Comments:

Product Var Name i_pbl4_flag
Is element of: GLA11 Record
Short Description: PBL optical depth flag for 532 nm
Product Data Type: i1b
Total Bytes: 1
Product Units: NA
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 15
Description: Composite Flag - see Breakout for details
Please see <a href='flags/i_pbl4_flag.pdf'> the PDF flag description in the next section for more details.
Comments:

Product Var Name i_AttFlg3
Is element of: GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record
Short Description: Attitude Flag 3
Product Data Type: i1b
Total Bytes: 1

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1

Description: Please see <a href='flags/i_AttFlg3.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_timecorflg

Is element of: GLA01 Main Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: time correction flag

Product Data Type: i2b

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: Indicates what instrument or bias corrections were applied to the times on this record. Please see <a href='flags/i_timecorflg.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_rdu

Is element of: GLA11 Record

Short Description: Range Delay Uncertainty

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: millimeters

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 10000

Description: Estimated uncertainty value in the range delay distance.

Comments:

Product Var Name i_spare2

Is element of: GLA11 Record

Short Description: Spare 2

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: NA

Invalid Value/Flag: N/A

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: GLA11 spare2.

Product Var Name i_SolarAngle

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Solar Angle

Product Data Type: i4b (4)

Total Bytes: 16

Product Units: micro-degrees

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -90000000

Product Maximum: 90000000

Description: Solar Angle above or below the plane tangent to the ellipsoid surface at the laser spot. Positive values mean the sun is above the horizon, while negative values mean it is below the horizon. The effect of atmospheric refraction is not included. This is a low-precision value, with approximately one degree accuracy.

Comments:

Product Var Name i_MRg_cldtop_temp

Is element of: GLA09 Record, GLA10 record, GLA11 Record

Short Description: Medium Resolution 532 nm Cloud Top Temperature

Product Data Type: i2b (10, 4)

Total Bytes: 80

Product Units: degrees Celsius * 100

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -10000

Product Maximum: 10000

Description: Medium Resolution 532 nm Cloud Top Temperature
Comments:

Product Var Name i_MRg_cldtop_pres
Is element of: GLA09 Record, GLA10 record, GLA11 Record
Short Description: Medium Resolution 532 nm Cloud Top Pressure
Product Data Type: i2b (10, 4)
Total Bytes: 80
Product Units: hPa * 10
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 20000
Description: Medium Resolution 532 nm Cloud Top Pressure
Comments:

Product Var Name i_MRg_cldtop_relh
Is element of: GLA09 Record, GLA10 record, GLA11 Record
Short Description: Medium Resolution 532 nm Cloud Top Relative Humidity
Product Data Type: i2b (10, 4)
Total Bytes: 80
Product Units: percentage * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 10000
Description: Medium Resolution 532 nm Cloud Top Relative Humidity
Comments:

Product Var Name i_MRg_cldbot_temp
Is element of: GLA09 Record, GLA10 record, GLA11 Record
Short Description: Medium Resolution 532 nm Cloud Bottom Temperature
Product Data Type: i2b (10, 4)
Total Bytes: 80
Product Units: degrees Celsius * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No

Product Minimum: -10000
Product Maximum: 10000
Description: Medium Resolution 532 nm Cloud Bottom Temperature
Comments:

Product Var Name i_MRg_cldbot_pres
Is element of: GLA09 Record, GLA10 record, GLA11 Record
Short Description: Medium Resolution 532 nm Cloud Bottom Pressure
Product Data Type: i2b (10, 4)
Total Bytes: 80
Product Units: hPa * 10
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 20000
Description: Medium Resolution 532 nm Cloud Bottom Pressure
Comments:

Product Var Name i_MRg_cldbot_relh
Is element of: GLA09 Record, GLA10 record, GLA11 Record
Short Description: Medium Resolution 532 nm Cloud Bottom Relative Humidity
Product Data Type: i2b (10, 4)
Total Bytes: 80
Product Units: percentage * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 10000
Description: Medium Resolution 532 nm Cloud Bottom Relative Humidity
Comments:

Product Var Name i_Aer_top_temp
Is element of: GLA10 record, GLA11 Record
Short Description: Aerosol Layers Temperature at Top of Layer at 532 nm
Product Data Type: i2b (9)
Total Bytes: 18
Product Units: degrees Celsius * 100
Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -10000
Product Maximum: 10000
Description: Aerosol Layers Temperature at Top of Layer at 532 nm
Comments:

Product Var Name i_Aer_top_pres
Is element of: GLA10 record, GLA11 Record
Short Description: Aerosol Layers Pressure at Top of Layer at 532 nm
Product Data Type: i2b (9)
Total Bytes: 18
Product Units: hPa * 10
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 20000
Description: Aerosol Layers Pressure at Top of Layer at 532 nm
Comments:

Product Var Name i_Aer_top_relh
Is element of: GLA10 record, GLA11 Record
Short Description: Aerosol Layers Relative Humidity at Top of Layer at 532 nm
Product Data Type: i2b (9)
Total Bytes: 18
Product Units: percentage * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 10000
Description: Aerosol Layers Relative Humidity at Top of Layer at 532 nm
Comments:

Product Var Name i_Aer_bot_temp
Is element of: GLA10 record, GLA11 Record
Short Description: Aerosol Layers Temperature at Bottom of Layer at 532 nm
Product Data Type: i2b (9)
Total Bytes: 18

Product Units: degrees Celsius * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -10000
Product Maximum: 10000
Description: Aerosol Layers Temperature at Bottom of Layer at 532 nm
Comments:

Product Var Name i_Aer_bot_pres
Is element of: GLA10 record, GLA11 Record
Short Description: Aerosol Layers Pressure at Bottom of Layer at 532 nm
Product Data Type: i2b (9)
Total Bytes: 18
Product Units: hPa * 10
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 20000
Description: Aerosol Layers Pressure at Bottom of Layer at 532 nm
Comments:

Product Var Name i_Aer_bot_relh
Is element of: GLA10 record, GLA11 Record
Short Description: Aerosol Layers Relative Humidity at Bottom of Layer at 532 nm
Product Data Type: i2b (9)
Total Bytes: 18
Product Units: percentage * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 10000
Description: Aerosol Layers Relative Humidity at Bottom of Layer at 532 nm
Comments:

Product Var Name i_Aer_ir_top
Is element of: GLA08 Record, GLA11 Record
Short Description: Elevation of Top of Aerosol Layers Detected in 1064 nm

Product Data Type: i2b (2)
Total Bytes: 4
Product Units: deka-meters
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -100
Product Maximum: 2200
Description: Elevation of Top of Aerosol Layers detected in 1064 nm
Comments:

Product Var Name i_Aer_ir_bot
Is element of: GLA08 Record, GLA11 Record
Short Description: Elevation of Bottom of Aerosol Layers Detected in 1064 nm
Product Data Type: i2b (2)
Total Bytes: 4
Product Units: deka-meters
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -100
Product Maximum: 2200
Description: Elevation of Bottom of Aerosol Layers Detected in 1064 nm.
Comments:

Product Var Name i_Aer_ir_top_temp
Is element of: GLA08 Record, GLA11 Record
Short Description: Temperature of Top of Aerosol Layers Detected in 1064 nm
Product Data Type: i2b (2)
Total Bytes: 4
Product Units: degrees Celsius * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -10000
Product Maximum: 10000
Description: Temperature of Top of Aerosol Layers Detected in 1064 nm
Comments:

Product Var Name i_Aer_ir_top_pres

Is element of: GLA08 Record, GLA11 Record
Short Description: Pressure of Top of Aerosol Layers Detected in 1064 nm
Product Data Type: i2b (2)
Total Bytes: 4
Product Units: hPa * 10
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 20000
Description: Pressure of Top of Aerosol Layers Detected in 1064 nm
Comments:

Product Var Name i_Aer_ir_top_relh
Is element of: GLA08 Record, GLA11 Record
Short Description: Relative Humidity of Top of Aerosol Layers Detected in 1064 nm
Product Data Type: i2b (2)
Total Bytes: 4
Product Units: percentage * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 10000
Description: Relative Humidity of Top of Aerosol Layers Detected in 1064 nm
Comments:

Product Var Name i_Aer_ir_bot_temp
Is element of: GLA08 Record, GLA11 Record
Short Description: Temperature of Bottom of Aerosol Layers Detected in 1064 nm
Product Data Type: i2b (2)
Total Bytes: 4
Product Units: degrees Celsius * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -10000
Product Maximum: 10000
Description: Temperature of Bottom of Aerosol Layers Detected in 1064 nm
Comments:

Product Var Name i_Aer_ir_bot_pres
Is element of: GLA08 Record, GLA11 Record
Short Description: Pressure of Bottom of Aerosol Layers Detected in 1064 nm
Product Data Type: i2b (2)
Total Bytes: 4
Product Units: hPa * 10
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 20000
Description: Pressure of Bottom of Aerosol Layers Detected in 1064 nm
Comments:

Product Var Name i_Aer_ir_bot_relh
Is element of: GLA08 Record, GLA11 Record
Short Description: Relative Humidity of Bottom of Aerosol Layers Detected in 1064 nm
Product Data Type: i2b (2)
Total Bytes: 4
Product Units: percentage * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 10000
Description: Relative Humidity of Bottom of Aerosol Layers Detected in 1064 nm
Comments:

Product Var Name i_MRir_cld_top
Is element of: GLA09 Record, GLA11 Record
Short Description: Elevation of Top of Cloud Layers Detected in 1064 nm at Medium Resolution
Product Data Type: i2b (10, 4)
Total Bytes: 80
Product Units: deka-meters
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -100
Product Maximum: 2200

Description: Elevation of Top of Cloud Layers Detected in 1064 nm at Medium Resolution data rate.
Comments:

Product Var Name i_MRir_cld_bot
Is element of: GLA09 Record, GLA11 Record
Short Description: Elevation of Bottom of Cloud Layers Detected in 1064 nm at Medium Resolution
Product Data Type: i2b (10, 4)
Total Bytes: 80
Product Units: deka-meters
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -100
Product Maximum: 2200
Description: Elevation of Bottom of Cloud Layers Detected in 1064 nm at Medium Resolution data rate.
Comments:

Product Var Name i_MRir_cldtop_temp
Is element of: GLA09 Record, GLA11 Record
Short Description: Temperature of Top of Cloud Layers Detected in 1064 nm at Medium Resolution
Product Data Type: i2b (10, 4)
Total Bytes: 80
Product Units: degrees Celsius * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -10000
Product Maximum: 10000
Description: Temperature of Top of Cloud Layers Detected in 1064 nm at Medium Resolution data rate.
Comments:

Product Var Name i_MRir_cldtop_pres
Is element of: GLA09 Record, GLA11 Record
Short Description: Pressure of Top of Cloud Layers Detected in 1064 nm at Medium Resolution
Product Data Type: i2b (10, 4)
Total Bytes: 80
Product Units: hPa * 10
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No

Product Minimum: 0
Product Maximum: 20000
Description: Pressure of Top of Cloud Layers Detected in 1064 nm at Medium Resolution data rate.
Comments:

Product Var Name i_MRir_cldtop_relh
Is element of: GLA09 Record, GLA11 Record
Short Description: Relative Humidity of Top of Cloud Layers in 1064 nm at Medium Resolution
Product Data Type: i2b (10, 4)
Total Bytes: 80
Product Units: percentage * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 10000
Description: Relative Humidity of Top of Cloud Layers in 1064 nm at Medium Resolution data rate.
Comments:

Product Var Name i_MRir_cldbot_temp
Is element of: GLA09 Record, GLA11 Record
Short Description: Temperature of Bottom of Cloud Layers Detected in 1064 nm at Medium Resolution
Product Data Type: i2b (10, 4)
Total Bytes: 80
Product Units: degrees Celsius * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -10000
Product Maximum: 10000
Description: Temperature of Bottom of Cloud Layers Detected in 1064 nm at Medium Resolution data rate.
Comments:

Product Var Name i_MRir_cldbot_pres
Is element of: GLA09 Record, GLA11 Record
Short Description: Pressure of Bottom of Cloud Layers Detected in 1064 nm at Medium Resolution
Product Data Type: i2b (10, 4)
Total Bytes: 80
Product Units: hPa * 10
Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 20000

Description: Pressure of Bottom of Cloud Layers Detected in 1064 nm at Medium Resolution data rate.

Comments:

Product Var Name i_MRir_cldbot_relh

Is element of: GLA09 Record, GLA11 Record

Short Description: Relative Humidity of Bottom of Cloud Layers Detected in 1064 nm at MR

Product Data Type: i2b (10, 4)

Total Bytes: 80

Product Units: percentage * 100

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 10000

Description: Relative Humidity of Bottom of Cloud Layers Detected in 1064 nm at Medium Resolution data rate.

Comments:

Product Var Name i_MRir_QAflag

Is element of: GLA09 Record, GLA11 Record

Short Description: Medium Resolution 1064 nm Cloud Layer QA Flag

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 20000

Description: Medium Resolution 1064 nm Cloud Layer QA Flag. Composite Flag - see Breakout for details

Please see <a href='flags/i_MRir_QAflag.pdf'> the PDF flag description in the next section for more details.

The data is arranged in 40 bytes.

bytes 1-18 are spares:

bytes 19-20 are af flags: The 4 'af' flags (4 bits each) are concatenated with the QAflag storage and are contained in bytes 19-20 starting at bit 0 of byte 20.

bytes 21-40 are QAflags: The QAflag portion has been stored such that interval 1 is in bytes 40-36, interval 2 in bytes 35-31, interval 3 in bytes 30-26, and interval 4 in bytes 25-21. Each of the 10 layer flags per interval is 4 bits in length as before, such that interval 1 layer 1 is in bits 0-3 and interval 1 layer 2 is in bits 4-7 of byte 40, interval 1 layer 3 is in bits 0-3 and interval 1 layer 4 is in bits 4-7 of byte 39, etc.

Quality flag value 15=cloud layers were not searched for; 0=cloud layers were searched but not detected; 1-14 indicate increasing confidence of good cloud retrieval (value 1=least confidence, value 14=greatest confidence).

Availability flag value 15=cloud layers not searched for; 0=layers searched for but not detected.

Comments:

Product Var Name i_Aer_PBL_LR_temp

Is element of: GLA08 Record, GLA11 Record

Short Description: Temperature of Low Resolution Planetary Boundary Layer Top at 532 nm

Product Data Type: i2b

Total Bytes: 2

Product Units: degrees Celsius * 100

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -10000

Product Maximum: 10000

Description: Temperature of Low Resolution Planetary Boundary Layer Top at 532 nm

Comments:

Product Var Name i_Aer_PBL_LR_pres

Is element of: GLA08 Record, GLA11 Record

Short Description: Pressure of Low Resolution Planetary Boundary Layer Top at 532 nm

Product Data Type: i2b

Total Bytes: 2

Product Units: hPa * 10

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 20000

Description: Pressure of Low Resolution Planetary Boundary Layer Top at 532 nm

Comments:

Product Var Name i_Aer_PBL_LR_relh

Is element of: GLA08 Record, GLA11 Record

Short Description: Relative Humidity of Low Resolution Planetary Boundary Layer Top at 532 nm

Product Data Type: i2b

Total Bytes: 2

Product Units: percentage * 100

Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 10000
Description: Relative Humidity of Low Resolution Planetary Boundary Layer Top at 532 nm
Comments:

Product Var Name i_Surface_temp
Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record
Short Description: Surface Temperature
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: degrees Celsius * 100
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -10000
Product Maximum: 10000
Description: Surface Temperature, 4 of 1-second intervals.
Comments:

Product Var Name i_Surface_pres
Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record
Short Description: Surface Pressure
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: hPa * 10
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 20000
Description: Surface Pressure, 4 of 1-second intervals.
Comments:

Product Var Name i_Surface_relh
Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record
Short Description: Surface Relative Humidity
Product Data Type: i2b (4)

Total Bytes: 8

Product Units: percentage * 100

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 10000

Description: Surface Relative Humidity, 4 of 1-second intervals.

Comments:

Product Var Name i_Surface_wind

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Surface Wind Speed

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: meters/second * 100

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 20000

Description: Surface Wind Speed, 4 of 1-second intervals. Wind speed at Earth's surface level measured in km/hour and derived from the meteorological data files.

Comments:

Product Var Name i_Surface_wdir

Is element of: GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record

Short Description: Surface Wind Direction Azimuth from North

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: degrees * 10

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 3600

Description: Surface wind direction azimuth from North, 4 of 1-second intervals. Wind direction at Earth's surface level measured in degrees of azimuth from North and derived from the meteorological data files.

Comments:

Product Var Name i_Aer_ir_OD

Is element of: GLA11 Record
Short Description: Aerosol Optical Depth at 1064 nm
Product Data Type: i2b (2)
Total Bytes: 4
Product Units: Unknown
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 0
Description: Aerosol Optical Depth at 1064 nm
Comments:

Product Var Name i_cld_ir_OD
Is element of: GLA11 Record
Short Description: Cloud Optical Depth at 1064 nm
Product Data Type: i2b (10, 4)
Total Bytes: 80
Product Units: Unknown
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 0
Description: Cloud Optical Depth at 1064 nm
Comments:

Product Var Name i_spare6
Is element of: GLA11 Record
Short Description: Spare 6
Product Data Type: i1b (202)
Total Bytes: 202
Product Units: n/a
Invalid Value/Flag: n/a
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: n/a
Product Maximum: n/a
Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.
Comments: GLA11 Spare6

Product Var Name i_reflct_1064od_40hz_cor
Is element of: GLA11 Record
Short Description: 40 Hz 1064nm total column od
Product Data Type: i2b (40, 4)
Total Bytes: 320
Product Units: unitless
Invalid Value/Flag: N/A
Is Correction Flag?: NA
Is Unsigned?: NA
Product Minimum: -100
Product Maximum: 10000
Description: Total column 1064nm optical depth from surface reflectance corrected for multiple scattering.
Comments:

Product Var Name i_reflct_1064msf_40hz
Is element of: GLA11 Record
Short Description: 40 Hz 1064nm multiple scattering corr. factor
Product Data Type: i1b (40, 4)
Total Bytes: 160
Product Units: unitless
Invalid Value/Flag: N/A
Is Correction Flag?: NA
Is Unsigned?: NA
Product Minimum: 0
Product Maximum: 255
Description: Total column od 1064nm multiple scattering correction factor.
Comments:

Product Var Name i_reflct_1064od_1hz_cor
Is element of: GLA11 Record
Short Description: 1 Hz 1064nm total column od
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: unitless
Invalid Value/Flag: N/A
Is Correction Flag?: NA
Is Unsigned?: NA
Product Minimum: -100
Product Maximum: 10000

Description: Total column 1064nm optical depth from surface reflectance corrected for multiple scattering.
Comments:

Product Var Name i_reflct_1064msf_1hz
Is element of: GLA11 Record
Short Description: 1 Hz 1064nm multiple scattering corr. factor
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: unitless
Invalid Value/Flag: N/A
Is Correction Flag?: NA
Is Unsigned?: NA
Product Minimum: 0
Product Maximum: 255
Description: Total column od 1064nm multiple scattering correction factor.
Comments:

Product Var Name i_reflct_pristine_1hz
Is element of: GLA11 Record
Short Description: 1064nm modeled surface reflectance
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: unitless
Invalid Value/Flag: N/A
Is Correction Flag?: NA
Is Unsigned?: NA
Product Minimum: 0
Product Maximum: 5000
Description: Modeled (calculated) 1064nm surface reflectance from wind speed.
Comments:

Product Var Name i_aod_4s
Is element of: GLA11 Record
Short Description: Total Column Aerosol OD (AOD)
Product Data Type: i2b
Total Bytes: 2
Product Units: unitless*1000
Invalid Value/Flag: N/A
Is Correction Flag?: NA
Is Unsigned?: NA

Product Minimum: -100

Product Maximum: 10000

Description: Total column aerosol optical depth (AOD).

Comments:

Product Var Name i_aod_flg_4s

Is element of: GLA11 Record

Short Description: AOD use flag

Product Data Type: i1b

Total Bytes: 1

Product Units: NA

Invalid Value/Flag: N/A

Is Correction Flag?: NA

Is Unsigned?: NA

Product Minimum: 0

Product Maximum: 15

Description: AOD use flag.

The total column AOD use flag ranges from 0 - 7 and has the following meanings:

0 - night, full column good, no bad layers, ground detected - highest quality

1 - day, no full column, sum of all detected layers, no bad layers, ground detected - highest daytime quality

2 - night, full column good, with detected lower layers with a bad layer

3 - night, full column good, with bad lower layers

4 - night, full column bad, includes only detected lower layers.

5 - day, no full column, sum of all good layers, but bad layer present

6 - night, full column good, but no ground detected

7 - day, no full column, good or no layers, but no ground detected

15 - invalid

Notes: In the descriptions above 'full column' means the extinction retrieval from 20 km to d_aod_botht_4s. 'Bad layer' means a layer for which extinction could not be computed.

Comments:

Product Var Name i_spare3

Is element of: GLA11 Record

Short Description: Spare 3

Product Data Type: i1b

Total Bytes: 1

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_bs_erd

Is element of: GLA11 Record

Short Description: Blowing Snow Range Delay

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: millimeters * 10

Invalid Value/Flag: None

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 255

Description: Estimated range delay due to blowing snow.

Comments:

Product Var Name i_bs_conf

Is element of: GLA11 Record

Short Description: Blowing Snow Confidence

Product Data Type: i1b (4)

Total Bytes: 4

Product Units: N/A

Invalid Value/Flag: N/A

Is Correction Flag?: NA

Is Unsigned?: NA

Product Minimum: 0

Product Maximum: 15

Description: A number that indicates the degree of confidence that this is indeed blowing snow. Blowing snow confidence ranges from 0 - 15 and has the following meanings:

15: profile never tested for blowing snow (outside of latitude limits, or over ocean).

14: wind speed too low or clouds above 1.5 km

7-13: BS detected, 532 used, low to high confidence in blowing snow

1-6: BS detected, 1064 used, low to high confidence in blowing snow

0: profile tested, but no blowing snow detected

Comments:

Product Var Name i_aer4_sval1

Is element of: GLA11 Record

Short Description: Aerosol true S Values from table

Product Data Type: i2b (9)

Total Bytes: 18

Product Units: 100*sr

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 100

Product Maximum: 20000

Description: Aerosol true extinction to backscatter ratios calculated from meteorological and geographic data

Comments:

Product Var Name i_aer4_sval_ratio

Is element of: GLA11 Record

Short Description: 532/1064 aerosol S ratio

Product Data Type: i2b (9)

Total Bytes: 18

Product Units: N/A

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 105

Product Maximum: 210

Description: The ratio of 532 nm extinction to backscatter ratio (S532) to the 1064 nm extinction to backscatter ratio (S1064) for each detected aerosol layer.

Comments:

Product Var Name i_aer4_aod_ratio

Is element of: GLA11 Record

Short Description: 532/1064 aerosol optical depth ratio

Product Data Type: i2b (9)

Total Bytes: 18

Product Units: N/A

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 120

Product Maximum: 380

Description: The ratio of 532 nm aerosol optical depth to 1064 nm aerosol optical depth for each detected aerosol layer.

Comments:

Product Var Name i_aer4_sval_uf

Is element of: GLA10 record, GLA11 Record

Short Description: Aerosol true S Values use flag

Product Data Type: i1b (5)

Total Bytes: 5

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 15

Description: Aerosol true S values use flag for 9 layers at 1 per 4 sec. Bits 0-3 (least significant bits) of byte 5 are for first layer, bits 0-3 of byte 1 are for 9th layer. 15 denotes no layer detected (invalid). Bits 36-39 are spares needed to make 5 bytes. Stipulates which extinction to backscatter ratio was used in processing (1=default, 2=calculated).

Please see <a href='flags/i_aer4_sval_uf.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_spare5

Is element of: GLA11 Record

Short Description: Spare 5

Product Data Type: i1b

Total Bytes: 1

Product Units: N/A

Invalid Value/Flag: N/A

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 255

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: GLA11 Spare 5

Product Var Name i_reflCor_atm

Is element of: GLA11 Record

Short Description: Reflectivity Correction Factor For Atmospheric Effects

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: Unitless

Invalid Value/Flag: N/A

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 1

Product Maximum: 1000000

Description: This reflectance correction factor is calculated as 1 / e^(-2(tc+ta+tp+tm)), where tc is the cloud (column) integrated optical depth, ta is the aerosol (column) integrated optical depth, tp is the planetary boundary layer optical depth, and tm is the molecular optical depth. tm is a constant equal to -log(gd_T_RTatm)/2, where gd_T_RTatm = 0.98 is defined in const_elev_mod.f90 or read from ANC07-03. The reflectance has been corrected for waveform saturation. The reflectance correction factor is computed from the 532 nm channel and has been corrected for multiple scattering.

Comments:

Product Var Name i_spare4

Is element of: GLA11 Record

Short Description: Spare 4

Product Data Type: i1b (160)

Total Bytes: 160

Product Units: NA

Invalid Value/Flag: None

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 255

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_rec_ndx

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: GLAS Record Index

Product Data Type: i4b

Total Bytes: 4

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: Unique index that relates this record to the corresponding record(s) in each GLAS data product.

Comments:

Product Var Name i_UTCTime

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Transmit Time of First Shot in frame in J2000

Product Data Type: i4b (2)

Total Bytes: 8

Product Units: seconds, microseconds

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: The transmit time of the first shot in the 1 second frame measured as 'UTC seconds' elapsed since Jan 1 2000 12:00:00 UTC. This time has been derived from the GPS time accounting for leap seconds. The first item is the whole number of seconds; the second item is the fractional part in microseconds.

Comments: This is not the ground bounce time, but the transmit time.

Product Var Name i_transtime

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: One way transit time

Product Data Type: i2b

Total Bytes: 2

Product Units: microseconds

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 4000

Description: One way transit time calculated using the preliminary range offset. This is added to the UTC time tag to get the ground bounce times at which to calculate the orbit

Comments:

Product Var Name i_Spare1

Is element of: GLA12 Record

Short Description: Spare 1

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: GLA12 spare1.

Product Var Name i_deltagpstmcor

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Delta GPS time correction

Product Data Type: i4b

Total Bytes: 4

Product Units: nanoseconds

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -1000000

Product Maximum: 1000000

Description: The high frequency delta GPS time correction calculated during the precision orbit processing step.

Comments:

Product Var Name i_dShotTime

Is element of: GLA01 Main Record, GLA04 LPA Main Record, GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Laser Shot Time Deltas (shots 2-40)

Product Data Type: i4b (39)

Total Bytes: 156

Product Units: microseconds

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1200000

Description: The time deltas of pulses 2 through 40 to i_UTCTime, the UTC time tag of the first pulse in the 1-second data frame. Adding the deltas to i_UTCTime will give the user the time of each individual shot in the frame.

Comments: To calculate the time for shots 2-40, add these deltas to the time of the first shot.

Product Var Name i_lat

Is element of: GLA12 Record

Short Description: Coordinate Data, Latitude, specific to ice sheet range

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: microdeg

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -90000000

Product Maximum: 90000000

Description: The geodetic latitude of the 40 laser spots in the 1 second time frame, computed from the Precision orbit determined GLAS laser antenna ground nadir coordinates, precision attitude, and ice sheet-specific range after all instrument corrections, atmospheric delays and tides have been applied. The values are in degrees North.

Comments:

Product Var Name i_lon

Is element of: GLA12 Record

Short Description: Coordinate Data, Longitude, specific to ice sheet range

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: microdeg

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 360000000

Description: The longitude of the 40 laser spots in the 1 second time frame, computed from the Precision orbit determined GLAS laser antenna ground nadir coordinates, precision attitude, and ice sheet-specific range after all instrument corrections, atmospheric delays and tides have been applied. The values are in east longitude.

Comments:

Product Var Name i_elev

Is element of: GLA12 Record

Short Description: Ice Sheet Surface elevation

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -500000

Product Maximum: 10000000

Description: Surface elevation with respect to the ellipsoid at the spot location determined by range using the ice sheet specific algorithm after instrument corrections, atmospheric delays and tides have been applied.

Comments:

Product Var Name i_campaign

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Campaign

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: INT(ICHAR(1A))

Product Maximum: INT(ICHAR(3K))

Description: The campaign. ie: for campaign L1A, it will be '1A'.

Comments:

Product Var Name i_spare40

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Spare 40

Product Data Type: i2b

Total Bytes: 2

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: n/a

Product Maximum: n/a

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: Spare 40.

Product Var Name i_cycTrk

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Cycle and Track

Product Data Type: i4b

Total Bytes: 4

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 10001

Product Maximum: 9991354

Description: The track and cycle. On the product, they will be stored as one number: ccctttt.

Comments:

Product Var Name i_localSolarTime

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Local apparent solar time

Product Data Type: i4b

Total Bytes: 4

Product Units: seconds*1000

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 86400000

Description: Local apparent solar time.

Comments:

Product Var Name i_spare41

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Spare 41

Product Data Type: i4b (7)

Total Bytes: 28

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: n/a

Product Maximum: n/a

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information

.Comments: Spare 41.

Product Var Name i_deltaEllip

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Delta Ellipsoid

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: mm

Invalid Value/Flag: n/a

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -9000

Product Maximum: 9000

Description: Surface Elevation (T/P ellipsoid) minus Surface Elevation(WGS84 ellipsoid).

Comments:

Product Var Name i_beamCoelv

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Co-elevation

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: degrees*100

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 36000

Description: Co-elevation (CE) is direction from vertical of the laser beam as seen by an observer located at the laser ground spot. 40Hz.

Comments:

Product Var Name i_beamAzimuth

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Azimuth

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: degrees*100

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 36000

Description: The direction, eastwards from north, of the laser beam vector as seen by an observer at the laser ground spot viewing toward the spacecraft (i.e., the vector from the ground to the spacecraft). When the spacecraft is precisely at the geodetic zenith, the value will be 99999 degrees. 40 Hz.

Comments:

Product Var Name i_d2refTrk

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Distance to the reference ground track

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: m*1000

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1000000000

Description: Distance to the reference ground track.

Comments:

Product Var Name i_SigBegOff

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA15 Record

Short Description: Signal Begin Range Offset

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -150000

Product Maximum: 0

Description: Offset to be added to i_refRng to give the range in distance to the location on the received echo calculated as the beginning of signal (closest to the spacecraft) using standard parameters.

Comments:

Product Var Name i_DEM_hires_src

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record

Short Description: High Resolution Source Flag

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 128

Description: Flag to specify who the source provider was for the high resolution DEM.

0 = no high res source available

1 = unfinished research Shuttle Radar Topography Mission (SRTM)

        C-band 90 m DEM produced by JPL (+-1.1km E-W swath)

2 = finished SRTM C-band 90 m DEM produced by NGA (+-2.1km E-W swath)

3 = ICESat Greenland V1 1km DEM

4 = ICESat Antarctica V1 500m DEM

5 = 90m Canadian Digital Elevation Data (CDED)

6 = 90m Canadian Digital Elevation Data (CDED) if available otherwise finished SRTM C-band 90 m DEM

Comments: DEM elevations are referenced to the TOPEX/Poseidon ellipsoid and are directly comparable to the elevation on the GLAS products.

Product Var Name i_DEMhiresArElv

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record

Short Description: DEMhiresArElv

Product Data Type: i2b (9, 40)

Total Bytes: 720

Product Units: meters

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -500

Product Maximum: 1300

Description: d_DEMhiresArElv is a 3 X 3 X 40 array of high resolution DEM values. The 1-40 index corresponds to 1/40 second samples. The 1-9 index corresponds to the position of the DEM value relative to the spot. Given the first 1/40 second of data, positional correspondence of the DEM element to the spot is as follows:

The 9 points on the product correspond to the 3x3 points in the alg variable as follows:

gla06%d_DEMhiresArElv(1,1,k) = gla06_prod%i_DEMhiresArElv(1,k) NW

gla06%d_DEMhiresArElv(2,1,k) = gla06_prod%i_DEMhiresArElv(2,k) N

gla06%d_DEMhiresArElv(3,1,k) = gla06_prod%i_DEMhiresArElv(3,k) NE

gla06%d_DEMhiresArElv(1,2,k) = gla06_prod%i_DEMhiresArElv(4,k) W

gla06%d_DEMhiresArElv(2,2,k) = gla06_prod%i_DEMhiresArElv(5,k) center

gla06%d_DEMhiresArElv(3,2,k) = gla06_prod%i_DEMhiresArElv(6,k) E

gla06%d_DEMhiresArElv(1,3,k) = gla06_prod%i_DEMhiresArElv(7,k) SW

gla06%d_DEMhiresArElv(2,3,k) = gla06_prod%i_DEMhiresArElv(8,k) S

gla06%d_DEMhiresArElv(3,3,k) = gla06_prod%i_DEMhiresArElv(9,k) SE

Comments:

Product Var Name i_ElevBiasCorr

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Elevation Bias Correction

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: mm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: NA

Product Minimum: 0

Product Maximum: 3000

Description: Correction to elevation based on post flight analysis for biases determined for each campaign. This bias correction has not been applied to the data so to apply it SUBTRACT the correction from the range estimate. To apply the correction to the elevations it must be ADDED to the elevation estimates.

Comments: See the altimeter user guide for full description.

Product Var Name i_spare42

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Spare 42

Product Data Type: i2b (4, 40)

Total Bytes: 320

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: n/a

Product Maximum: n/a

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: Spare 42

Product Var Name i_sigmaatt

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Attitude Quality Indicator

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: Unitless

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 6000

Description: Attitude quality indicator. Values: 0=good; 50=warning; 100=bad.

Comments: This indicator currently has only 3 values: 0, 50, and 100, leaving open the opportunity to use numbers in between for further resolution of the degradation as our knowledge improves.

Product Var Name i_Azimuth

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Local Azimuth

Product Data Type: i4b

Total Bytes: 4

Product Units: millideg

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 360000

Description: Mean azimuth measured clockwise from north based on latitude, longitude, and elevation of a 1 second interval of the trace of the ground footprint-center.

Comments:

Product Var Name i_SolAng

Is element of: GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Solar Angle

Product Data Type: i4b

Total Bytes: 4

Product Units: microdeg

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -90000000

Product Maximum: 90000000

Description: Solar Angle above or below the plane tangent to the ellipsoid surface at the laser spot. Positive values mean the sun is above the horizon, while negative values mean it is below the horizon. The effect of atmospheric refraction is not included. This is a low-precision value, with approximately one degree accuracy.

Comments:

Product Var Name i_tpintensity_avg

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Transmit Pulse intensity - frame avg

Product Data Type: i4b

Total Bytes: 4

Product Units: counts

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 25500

Description: Transmit pulse intensity as measured by the LPA. Average over the 1-second frame. From ANC09.

Comments:

Product Var Name i_tpazimuth_avg

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Transmit Pulse azimuth - frame avg

Product Data Type: i2b

Total Bytes: 2

Product Units: degrees*10

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 3600

Description: Transmit pulse azimuth. Average over the 1-second frame. Angle eastwards from north of the major axis of the transmit pulse, as seen by the LPA. From ANC09.

Comments:

Product Var Name i_tpeccentricity_avg

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Transmit Pulse eccentricity - frame avg

Product Data Type: i2b

Total Bytes: 2

Product Units: Unitless*1000

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1000

Description: Transmit pulse eccentricity as measured by the LPA. Average over the 1-second frame. From ANC09.

Comments:

Product Var Name i_tpmajoraxis_avg

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Transmit Pulse major axis - frame avg

Product Data Type: i2b

Total Bytes: 2

Product Units: cm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 10000

Description: Transmit pulse major axis as measured by the LPA. Average over the 1-second time frame. From ANC09.

Comments:

Product Var Name i_poTide

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Pole Tide

Product Data Type: i2b

Total Bytes: 2

Product Units: mm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -10000

Product Maximum: 10000

Description: Pole tide: an ocean tide which is the result of the Chandler
wobble (a free nutation of the Earth caused by fluctuating
pressure on the bottom of the ocean, caused by temperature
and salinity changes and wind-driven changes in the circulation
of the oceans).

Comments:

Product Var Name i_gdHt

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Geoid

Product Data Type: i2b (2)

Total Bytes: 4

Product Units: cm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -20000

Product Maximum: 20000

Description: The height of the geoid above the ellipsoid for the first and last shot in the record.

Comments:

Product Var Name i_erElv
Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: Solid Earth Tide Elevation (at first & last shot)
Product Data Type: i2b (2)
Total Bytes: 4
Product Units: mm
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -10000
Product Maximum: 10000
Description: The solid earth tide elevation for the first & last shot in the record.
Comments:

Product Var Name i_spElv
Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: Tide Elevations, Specific
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: mm
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -10000
Product Maximum: 10000
Description: A tide elevation calculated from alternate tide models for specific regions for shots 1, 11, 21, and 31.
Comments:

Product Var Name i_ldElv
Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: Load Tide Elevation
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: mm
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -10000

Product Maximum: 10000

Description: The load tide elevation applied to each shot. Elements 1-4 of the load tide vector are applied to shots 1-10, 11-20, 21-30, and 31-40, respectively.

Comments: The load tide is NOT NECESSARILY the load tide for shots 1,11,21,31. It is calculated for the first valid shot in each group of 10 and applied to all valid shots in the group.

Product Var Name i_spare12

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record

Short Description: Spares 12

Product Data Type: i2b (2)

Total Bytes: 4

Product Units: N/A

Invalid Value/Flag: None

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_wTrop

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Range Correction_Wet Troposphere

Product Data Type: i2b (2)

Total Bytes: 4

Product Units: mm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -1000

Product Maximum: 0

Description: The range correction due to the wet troposphere at first & last shot.

Comments:

Product Var Name i_dTrop

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA15 Record

Short Description: Range Correction, Dry Troposphere

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: mm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -2500

Product Maximum: 0

Description: The range correction due to the dry troposphere; one correction for each shot.Validity is based on results of finding a range with the standard fit.

Comments:

Product Var Name i_surfType

Is element of: GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Region Type

Product Data Type: i1b

Total Bytes: 1

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 1

Product Maximum: 15

Description: Describes the region type or types associated with each shot Ice Sheet, ocean, sea ice, or Land.

Please see <a href='flags/i_surfType.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_spare11

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record

Short Description: Spare 11

Product Data Type: i1b (3)

Total Bytes: 3

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: n/a

Product Maximum: n/a

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_DEM_elv

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record

Short Description: DEM Elevation

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: cm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -50000

Product Maximum: 1000000

Description: Elevation at the footprint location from the SRTM30 (GTOPO30 + SRTM) Digital Elevation Model (DEM). The reference frame for the DEM elevation was changed to the TOPEX/Poseidon ellipsoid to make it consistent with the GLAS elevations.

Comments:

Product Var Name i_refRng

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Reference Range

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 400000000

Product Maximum: 1000000000

Description: Range in distance calculated from the time between the centroid of the transmit pulse and the farthest gate from the spacecraft of the received pulse. See the rngcorrflg to determine any corrections that have been applied.

Comments:

Product Var Name i_TrshRngOff

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA15 Record

Short Description: Threshold Retracker Range Offset

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -150000

Product Maximum: 0

Description: Offset to be added to i_refRng to give the range in distance to the threshold retracker location on the received echo using standard parameters.

Comments:

Product Var Name i_isRngOff

Is element of: GLA06 record, GLA12 Record, GLA14 Record

Short Description: Ice Sheet Range Offset

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -150000

Product Maximum: 0

Description: Range offset to be added to i_refRng to calculate the range using the algorithm deemed appropriate for ice sheets.

Comments: Can be used for comparing elevations computed from results standard and alternate fitting.

Product Var Name i_SigEndOff

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA15 Record

Short Description: Signal End Range Offset

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -150000

Product Maximum: 0

Description: Offset to be added to i_refRng to give the range in distance to the location on the received echo calculated as the end of signal (farthest from the spacecraft) using standard parameters.

Comments:

Product Var Name i_cntRngOff

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA15 Record

Short Description: Centroid Range Offset

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -150000

Product Maximum: 0

Description: Offset to be added to i_refRng to give the range in distance to the location of the centroid of the received echo from signal begin through signal end defined by the standard parameters.

Comments:

Product Var Name i_reflctUC

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: reflctUC

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: Unitless*1E06

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1000000

Description: Reflectivity, not corrected for atmospheric effects, is calculated as Refl = R/T, where R is the received energy after it has been scaled for range, and T is the transmitted energy. i_reflctUC has also been calibrated for gain non-linearity (only for non-saturated waveforms), ground truth calibration and boresight shift shadowing (BSS). It is not corrected for saturation effects. If the shot is saturated (satindex above 2) then to correct for saturation the reflectivity estimate needs to be multiplied by the ratio of the corrected energy to the uncorrected energy (sat corrected reflectivity = i_reflctUC * (i_RecNrgAll + i_satNrgCorr)/i_RecNrgAll)

The atmospheric corrected reflectivity may be calculated from this uncorrected reflectivity by multiplying it by d_reflCor_atm.

i_reflctUC is invalid where GLA06%d_satNrgCorr is invalid.

Comments: This uses all signal between signal begin and signal end.

Product Var Name i_reflCor_atm

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Reflectivity Correction Factor For Atmospheric Effects

Product Data Type: i4b

Total Bytes: 4

Product Units: Unitless

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 1

Product Maximum: 250

Description: This reflectance correction factor is calculated as 1 / e^(-2(tc+ta+tp+tm)), where tc is the cloud (column) integrated optical depth, ta is the aerosol (column) integrated optical depth, tp is the planetary boundary layer optical depth, and tm is the molecular optical depth. tm is a constant equal to -log(gd_T_RTatm)/2, where gd_T_RTatm = 0.98 is defined in const_elev_mod.f90 or read from ANC07-03. The attenuation correction factor has been corrected for multiple scattering. The reflectance has been corrected for waveform saturation.

Comments:

Product Var Name i_maxSmAmp

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Peak Amplitude of Smoothed Received Echo

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: Tenth of millivolts

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -300

Product Maximum: 30000

Description: The peak amplitude of the received echo after it has been smoothed to remove high frequency noise (see ATBD).

Comments: This is calculated after converting the return to voltage.

Product Var Name i_ocElv

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Ocean Tide Elevation

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: mm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -10000

Product Maximum: 10000

Description: The ocean tide elevation from the TPX07.1 tide model.

Comments:

Product Var Name i_numPk

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA15 Record

Short Description: Number of Peaks found in the Return

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 6

Description: The number of peaks in the return echo found by the Gaussian fitting procedure, using standard parameters.

Comments:

Product Var Name i_kurt2

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA15 Record

Short Description: Kurtosis of the Received Echo (standard)

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: unitless * 100

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -1000

Product Maximum: 1000

Description: Kurtosis of the received echo from signal begin to signal end using standard parameters

Comments: Note that the received echo was calibrated and converted to voltage before calculation.

Product Var Name i_skew2

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA15 Record

Short Description: Skewness

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: unitless * 100

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -10000

Product Maximum: 10000

Description: The skewness of the received echo from signal begin to signal end using standard parameters.

Comments: Note that the received echo was calibrated and converted to voltage before calculation.

Product Var Name i_spare4

Is element of: GLA06 record, GLA12 Record, GLA14 Record, GLA15 Record

Short Description: Spare 4

Product Data Type: i1b (160)

Total Bytes: 160

Product Units: null

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_IsRngLast

Is element of: GLA12 Record

Short Description: Ice Sheet Range offset using last peak

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -150000

Product Maximum: 0

Description: Range offset to be added to i_refRng to calculate ice sheet specific range from centroid of last peak in standard Gaussian fit.

Comments:

Product Var Name i_IsRngFst

Is element of: GLA12 Record

Short Description: Ice Sheet Range Offset using first peak

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -150000

Product Maximum: 0

Description: Range offset to be added to i_refRng to calculate ice sheet specific range from centroid of first peak in standard Gaussian fit

Comments:

Product Var Name i_IceSVar

Is element of: GLA12 Record

Short Description: Standard Deviation of the ice sheet Gaussian Fit

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: microvolts*10

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 30000

Description: The Standard deviation of the difference between the functional fit and the received echo using standard parameters. It is directly taken from GLA05 parameter d_wfFitSDev_2 (standard).

Comments:

Product Var Name i_ElvuseFlg

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Elevation use flag

Product Data Type: i1b (5)

Total Bytes: 5

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -127

Product Maximum: 127

Description: Flag indicating whether the elevations on this record should be used or not (1 bit set/shot). See the <a href='flags/i_ElvuseFlg.pdf'>PDF file</A> for more information.

Comments:

Product Var Name i_atm_avail

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Atmosphere Availability Flag

Product Data Type: i1b

Total Bytes: 1

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 15

Description: Please see <a href='flags/i_atm_avail.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_spare16

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Spare 16

Product Data Type: i1b (4)

Total Bytes: 4

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: n/a

Product Maximum: n/a

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_cld1_mswf

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Cloud Multiple Scattering Warning Flag

Product Data Type: i1b

Total Bytes: 1

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 15

Description: The multiple scattering warning flag (MSWF) is based on the total column optical depth (aerosol plus cloud) calculated in GLA11 using 532nm. It is intended as a way to quickly obtain information about the potential severity of multiple scattering with regards to the range-to-surface calculated by the altimetry processing software. It will be output on the GLA11 product for use by the altimetry group. The multiple scattering warning flag will have values ranging from 0-14, based on the total column optical depth as detailed in the PDF.

A warning flag value of 15 will signify ?invalid?. An invalid will be encoded if an optical depth in any of the layers in the 1-second column could not be calculated. This usually occurs in a very optically ?thick? cloud which extinguishes the signal. It could also occur if the extinction-to-backscatter ratio assignment is set too high, causing the transmission calculations in the lidar inversion to go out-of-range.Please see <a href='flags/i_cld1_mswf_elv.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_MRC_af

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Medium Resolution Cloud Availability Flag

Product Data Type: i1b

Total Bytes: 1

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 15

Description: Tells how many cloud layers were found at this resolution from the 532 nm channel. Please see <a href='flags/i_MRC_af.pdf'> the PDF flag description in the next section for more details. This parameter is extracted from the i_MRCL_flag on GLA09.

Comments:

Product Var Name i_spare9

Is element of: GLA06 record, GLA12 Record, GLA14 Record

Short Description: Spare 9

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: null

Invalid Value/Flag: N/A

Is Correction Flag?: NA

Is Unsigned?: NA

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_ElvFlg

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Elevation Definition Flag

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 127

Description: Indicates how location on the received echo was determined to calculate the elevation on the record.

Please see <a href='flags/i_ElvFlg.pdf'> the PDF flag description in the next section for more details. 'For GLA05, 06 and 12,13,14 and 15, bits are set to reflect the range offset used for that products elevation. Although defined as a pass-thru, the values are different on GLA06/12,13,15 and GLA14.'

Comments:

Product Var Name i_rng_UQF

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Range Offset Quality/Use Flag

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: Data quality flag for the range offsets on this record.

Please see <a href='flags/i_rng_UQF.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_spare49

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Spare 49

Product Data Type: i1b (10)

Total Bytes: 10

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_timecorflg

Is element of: GLA01 Main Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: time correction flag

Product Data Type: i2b

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: Indicates what instrument or bias corrections were applied to the times on this record. Please see <a href='flags/i_timecorflg.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_APID_AvFlg

Is element of: GLA01 Main Record, GLA02 Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: APID Data Availability Flag

Product Data Type: i1b (8)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -127

Product Maximum: 127

Description: Flag indicating which packets (APIDs) for each second are available missing, or filled. APID 19 is broken down further into Altimeter Digitizer, Photon Counter, Cloud Digitizer, GPS/DEM, and C&T sections.

Please see the PDF flag description in the next section for more details.

Comments:

Product Var Name i_AttFlg2

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Attitude Flag 2

Product Data Type: i1b (20)

Total Bytes: 20

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 15

Description: Denotes at 40/sec rate whether precision attitude was used to determine spot location, and if problems with LPA, etc.

Please see <a href='flags/i_AttFlg2.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_spare5

Is element of: GLA12 Record

Short Description: Spares

Product Data Type: i1b

Total Bytes: 1

Product Units: NA

Invalid Value/Flag: N/A

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_FrameQF

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Altimeter Frame Quality Flag

Product Data Type: i1b

Total Bytes: 1

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1

Description: Denotes all bad data (no signal in whole frame), or all data good and all science team recommended corrections applied

Please see <a href='flags/i_FrameQF.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_OrbFlg

Is element of: GLA01 Main Record, GLA02 Record, GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: POD flag (Orbit Flag)

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 128

Description: Denotes quality of orbit, whether predicted or precision, loss of GPS data, maneuver-degraded, etc.

Please see <a href='flags/i_OrbFlg.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_rngCorrFlg

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Range Correction Flag

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: Denotes which geophysical or instrument corrections have been applied to the range in the calculation of the elevation on this record.

Please see <a href='flags/i_rngCorrFlg.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_CorrStatFlg

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Correction Status Flag

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: For each geophysical correction that has multiple values denotes which algorithm or model was used.

Please see <a href='flags/i_CorrStatFlg.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_spare15

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Spare 15

Product Data Type: i1b (8)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: n/a

Product Maximum: n/a

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_AttFlg1

Is element of: GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Attitude Flag 1

Product Data Type: i2b

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: At 1/sec denotes large off-nadir angle, ocn sweep, target of opportunity, steering to reference track.

Please see <a href='flags/i_AttFlg1.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_Spare6

Is element of: GLA12 Record

Short Description: Spare 6

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: GLA12 spare6.

Product Var Name i_spare44

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record

Short Description: Spare 44

Product Data Type: i1b (120)

Total Bytes: 120

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: n/a

Product Maximum: n/a

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_satNdx

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Saturation Index

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: ns

Invalid Value/Flag: gi_invalid_i1b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 126

Description: The count of the number of gates in a waveform which have an amplitude greater than or equal to i_satNdxTh (set in anc07_0004). The value 126 means 126 or more gates are above the saturation index threshold (i_satNdxth).

Comments:

Product Var Name i_satElevCorr

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Saturation Elevation Correction

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: mm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 3000

Description: Correction to elevation for saturated waveforms. This correction has not been applied to the data so to apply it SUBTRACT the correction from the range estimate. To apply the correction to the elevations it must be ADDED to the elevation estimates.

Comments:

Product Var Name i_satCorrFlg

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Saturation Correction Flag

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: Yes

Is Unsigned?: NA

Product Minimum: NA

Product Maximum: NA

Description: Please see <a href='flags/i_satCorrFlg.pdf'> the PDF flag description in the next section for more details.

Bits 0-3: i_satElevCorr flag (4 bits); values indicated below:

0= Not Saturated (i_satNdx < 2) or No Signal

1= Sat. Correction is Inconsequential (i_satNdx >= 2 & i_pctSat < 2.0)

2= Sat. Correction is Applicable (i_satNdx >= 2 & i_pctSat >= 2.0 & Full Width* < 100ns)

3= Sat. Correction is Not Computable effects elevations can not be corrected

4= Sat. Correction model is Not Applicable so data can not be corrected (i_satNdx >= 2 & i_pctSat >= 2.0 & Full Width* >= 100ns) there are errors in the data but the effects on elevations can not be corrected

values 5-15=TBD

Bits 4-5: i_satNrgCorr flag (2 bits):

0=TBD

1=TBD

2=TBD

3=TBD

Bits 6-7: TBD:

0=TBD

1=TBD

2=TBD

3=TBD

Comments:

Product Var Name i_satNrgCorr

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Saturation Energy Correction

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: .01fJ

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 100

Description: Correction to energy for saturated waveforms. This correction has not been applied to the energy. It should be ADDED to any echo pulse energy calculated from the pulse area under the waveform. Also any reflectivity estimates need to be corrected for this error in energy measurement.

Comments:

Product Var Name i_spare13

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record

Short Description: Spare 13

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: null

Invalid Value/Flag: null

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_gval_rcv

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Gain Value used for Received Pulse

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: counts

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 255

Description: Gain value used for received pulse - uncalibrated.

Comments: This value is in counts and needs to be calibrated before calculating energy from it. Same as variable in GLA01_Long/i_gainSet1064.

Product Var Name i_RecNrgAll

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Received Energy signal begin to signal end

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: 0.01 fJoules

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32000

Description: This is a pass through of gla01%d_recNrgAll_EU, but stored in different units on the product. This is calculated by taking the area under the received waveform (referenced to the observed noise) from all responses between the noise crossing before the first threshold crossing and the noise crossing after the last threshold crossing. It is a rescaled value of GLA01 parameter d_recNrgAll_EU and is not recomputed.

Comments:

Product Var Name i_FRir_cldtop

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Full Resolution 1064 Cloud Top

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: deka-meters

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1030

Description: Full resolution (40 Hz) cloud top height obtained from the 1064 atmospheric channel. This parameter is for a 1 second record. This parameter is in GLA09.

Comments:

Product Var Name i_FRir_qaFlag

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Full Resolution 1064 Quality Flag

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 15

Description: One byte per data quality flag.

Value 15 = No clouds.

Value 14 = Indicates the likely presence of low clouds (< 150 m) based on elevated signal from the two bins above the ground return bin that were not detected directly by the cloud search algorithm. When this occurs, the 40 Hz cloud top height (i_Frir_cldtop) is set to a value of 0.10 km.

Value 13 = Indicates the possible presence of a cloud based on the value of the integrated signal parameter (i_FRir_intsig) that was not detected directly by the cloud search algorithm. When this occurs, the 40 Hz cloud top height (i_Frir_cldtop) is set to a value of 10.0 km.

Value 0 - 12 = Cloud detected by cloud search algorithm with higher numbers indicating a stronger average signal from the region starting at cloud top and extending 500 m below cloud top height. Please see <a href='flags/i_FRir_qaFlag.pdf'> the PDF flag description in the next section for more details. This parameter is extracted from the equivalent parameter on GLA09.

Comments:

Product Var Name i_atm_char_flag

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Atmosphere Characterization Flag

Product Data Type: i2b

Total Bytes: 2

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 10

Description: Flag to characterize cloud and blowing snow state of the atmosphere

0 clear

1 high cloud (> 5 km) low optical depth

2 high cloud (> 5 km), high optical depth

3 mid cloud (>2, <=5 km) low optical depth

4 mid cloud (>2, <=5 km) high optical depth

5 low cloud (> 500 m, <=2 km), low optical depth

6 low cloud (> 500 m, <=2 km), high optical depth

7 blowing snow or fog (< 500 m), low optical depth

8 blowing snow or fog (< 500 m), high optical depth

9 not tested

10 data quality insufficient to assign flag

Comments:

Product Var Name i_atm_char_conf

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Atmosphere Characterization Flag Confidence

Product Data Type: i2b

Total Bytes: 2

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 3

Description: Confidence level ascribed to the atmosphere characterization flag

Comments: 0 Not applicable (for contamination flag values of 9 or 10)

1 low confidence

2 reasonable confidence

3 high confidence

Product Var Name i_spare48

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Spare 48

Product Data Type: i1b (36)

Total Bytes: 36

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: n/a

Product Maximum: n/a

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_FRir_intsig

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Full Resolution 1064 Integrated Signal

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: e7/(m-sr)

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 10000

Description: Though called 'integrated signal' this is actually an average of all bins in the above-ground portion of the 1064 40 Hz profile with values above the threshold of 1.0e-7 (1/(m-sr) units). This parameter is for a 1 second record. This parameter is extracted from the equivalent parameter on GLA09.

Comments:

Product Var Name i_spare14

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Spare 14

Product Data Type: i1b (120)

Total Bytes: 120

Product Units: Unknown

Invalid Value/Flag: gi_invalid_i1b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_Surface_temp

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Surface Temperature

Product Data Type: i2b

Total Bytes: 2

Product Units: degrees Celsius * 100

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -10000

Product Maximum: 10000

Description: Atmospheric temperature at Earth's surface level measured in degrees Celsius and derived from the meteorological data files.

Comments:

Product Var Name i_Surface_pres

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Surface Pressure

Product Data Type: i2b

Total Bytes: 2

Product Units: hPa * 10

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 20000

Description: Atmospheric pressure at Earth's surface level measured in hPa and derived from the meteorological data files.

Comments:

Product Var Name i_Surface_relh

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Relative Humidity

Product Data Type: i2b

Total Bytes: 2

Product Units: percentage * 100

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 10000

Description: Atmospheric relative humidity at Earth's surface level measured as a percentage and derived from the meteorological data files.

Comments:

Product Var Name i_maxRecAmp

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Max Amplitude of Received Echo

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: Tenth of millivolts

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -300

Product Maximum: 30000

Description: Maximum Amplitude of the Received Echo.

Comments: This is calculated after converting the return to voltage. Use for scaling model fit RMS between normalized and un-normalized units.

Product Var Name i_sDevNsOb1

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Standard deviation of 1064 nm Background noise, (alternate)

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: 0.0001 volts

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 30000

Description: The standard deviation of the background noise (alternative parameters).

Comments: Can be used for computing signal-to-noise ratio along with unsmoothed max amplitude.

Product Var Name i_pctSAT

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Percent Saturation

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: percent

Invalid Value/Flag: gi_invalid_i1b

Is Correction Flag?: Yes

Is Unsigned?: NA

Product Minimum: -127

Product Maximum: 127

Description: Percent saturation (d_pctSAT) is calculated using the formula: d_pctSAT= 100*(saturation index)/(signal end - signal begin in nanoseconds). The alternate signal end/begin are used for GLA14%d_pctSAT, while the standard fit values are used for GLA06, 12, 13, and 15. The Saturation elevation correction is not applied in the geolocation processing computation of lat, lon and elev. Because the saturation corrections are small and data is acquired within 5 deg off nadir, effects on lat and lon can be ignored. To apply the saturation elevation correction to the elevations on the products it must be ADDED to the elevation estimates. Reported elevations for returns with invalid satElevCorr values and satCorrFlg values of 3 or 4 are likely to have large, uncorrectable errors and should be excluded from analyses.

Comments:

Product Var Name i_TxNrg

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: 1064 nm Laser Transmit Energy

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: 0.01 millijoules

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32766

Description: The 1064 nm laser pulse transmitted energy in energy units, computed from the digitized outgoing pulse, and the transmit gain.

Comments:

Product Var Name i_eqElv

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Equilibrium Tide Elevation (at first & last shot)

Product Data Type: i2b (2)

Total Bytes: 4

Product Units: mm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: NA

Product Minimum: -10000

Product Maximum: 10000

Description: The equilibrium (long period) tide at first and last valid shot over the ocean.

Comments:

Product Var Name i_Spare7

Is element of: GLA06 record, GLA12 Record, GLA13 Record

Short Description: Spare 7

Product Data Type: i1b (282)

Total Bytes: 282

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: GLA06, GLA12, GLA13 spare7.

Product Var Name i_rec_ndx

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: GLAS Record Index

Product Data Type: i4b

Total Bytes: 4

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: Unique index that relates this record to the corresponding record(s) in each GLAS data product.

Comments:

Product Var Name i_UTCTime

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Transmit Time of First Shot in frame in J2000

Product Data Type: i4b (2)

Total Bytes: 8

Product Units: seconds, microseconds

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: The transmit time of the first shot in the 1 second frame measured as 'UTC seconds' elapsed since Jan 1 2000 12:00:00 UTC. This time has been derived from the GPS time accounting for leap seconds. The first item is the whole number of seconds; the second item is the fractional part in microseconds.

Comments: This is not the ground bounce time, but the transmit time.

Product Var Name i_transtime

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: One way transit time

Product Data Type: i2b

Total Bytes: 2

Product Units: microseconds

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 4000

Description: One way transit time calculated using the preliminary range offset. This is added to the UTC time tag to get the ground bounce times at which to calculate the orbit

Comments:

Product Var Name i_Spare1

Is element of: GLA13 Record

Short Description: Spare 1

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: GLA13 spare1.

Product Var Name i_deltagpstmcor

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Delta GPS time correction

Product Data Type: i4b

Total Bytes: 4

Product Units: nanoseconds

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -1000000

Product Maximum: 1000000

Description: The high frequency delta GPS time correction calculated during the precision orbit processing step.

Comments:

Product Var Name i_dShotTime

Is element of: GLA01 Main Record, GLA04 LPA Main Record, GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Laser Shot Time Deltas (shots 2-40)

Product Data Type: i4b (39)

Total Bytes: 156

Product Units: microseconds

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1200000

Description: The time deltas of pulses 2 through 40 to i_UTCTime, the UTC time tag of the first pulse in the 1-second data frame. Adding the deltas to i_UTCTime will give the user the time of each individual shot in the frame.

Comments: To calculate the time for shots 2-40, add these deltas to the time of the first shot.

Product Var Name i_lat

Is element of: GLA13 Record

Short Description: Coordinate Data, Latitude, specific to sea ice range

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: microdeg

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -90000000

Product Maximum: 90000000

Description: The geodetic latitude of the 40 laser spots in the 1 second time frame, computed from the Precision orbit determined GLAS laser antenna ground nadir coordinates, PAD, and sea ice specific range after all atmospheric corrections and tides have been applied.

Comments:

Product Var Name i_lon

Is element of: GLA13 Record

Short Description: Coordinate Data, Longitude, specific to sea ice range

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: microdeg

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 360000000

Description: The longitude of the 40 laser spots in the 1 second time frame, computed from the Precision orbit determined GLAS laser antenna ground nadir coordinates, PAD, and sea ice specific range after all atmospheric corrections and tides have been applied. The values are in east longitude.

Comments:

Product Var Name i_elev

Is element of: GLA13 Record

Short Description: Sea Ice Surface Elevation

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -500000

Product Maximum: 10000000

Description: Surface elevation wrt ellipsoid at the spot location determined by range using the sea ice specific fitting procedure after atmospheric delays and tides have been applied.

Comments:

Product Var Name i_campaign

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Campaign

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: INT(ICHAR(1A))

Product Maximum: INT(ICHAR(3K))

Description: The campaign. ie: for campaign L1A, it will be '1A'.

Comments:

Product Var Name i_spare40

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Spare 40

Product Data Type: i2b

Total Bytes: 2

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: n/a

Product Maximum: n/a

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: Spare 40.

Product Var Name i_cycTrk

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Cycle and Track

Product Data Type: i4b

Total Bytes: 4

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 10001

Product Maximum: 9991354

Description: The track and cycle. On the product, they will be stored as one number: ccctttt.

Comments:

Product Var Name i_localSolarTime

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Local apparent solar time

Product Data Type: i4b

Total Bytes: 4

Product Units: seconds*1000

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 86400000

Description: Local apparent solar time.

Comments:

Product Var Name i_spare41

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Spare 41

Product Data Type: i4b (7)

Total Bytes: 28

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: n/a

Product Maximum: n/a

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: Spare 41.

Product Var Name i_deltaEllip

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Delta Ellipsoid

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: mm

Invalid Value/Flag: n/a

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -9000

Product Maximum: 9000

Description: Surface Elevation (T/P ellipsoid) minus Surface Elevation(WGS84 ellipsoid).

Comments:

Product Var Name i_beamCoelv

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Co-elevation

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: degrees*100

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 36000

Description: Co-elevation (CE) is direction from vertical of the laser beam as seen by an observer located at the laser ground spot. 40Hz.

Comments:

Product Var Name i_beamAzimuth

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Azimuth

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: degrees*100

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 36000

Description: The direction, eastwards from north, of the laser beam vector as seen by an observer at the laser ground spot viewing toward the spacecraft (i.e., the vector from the ground to the spacecraft). When the spacecraft is precisely at the geodetic zenith, the value will be 99999 degrees. 40 Hz.

Comments:

Product Var Name i_d2refTrk

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Distance to the reference ground track

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: m*1000

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1000000000

Description: Distance to the reference ground track.

Comments:

Product Var Name i_SigBegOff

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA15 Record

Short Description: Signal Begin Range Offset

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -150000

Product Maximum: 0

Description: Offset to be added to i_refRng to give the range in distance to the location on the received echo calculated as the beginning of signal (closest to the spacecraft) using standard parameters.

Comments:

Product Var Name i_DEM_hires_src

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record

Short Description: High Resolution Source Flag

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 128

Description: Flag to specify who the source provider was for the high resolution DEM.

0 = no high res source available

1 = unfinished research Shuttle Radar Topography Mission (SRTM)

      C-band 90 m DEM produced by JPL (+-1.1km E-W swath)

2 = finished SRTM C-band 90 m DEM produced by NGA (+-2.1km E-W swath)

3 = ICESat Greenland V1 1km DEM

4 = ICESat Antarctica V1 500m DEM

5 = 90m Canadian Digital Elevation Data (CDED)

6 = 90m Canadian Digital Elevation Data (CDED) if available otherwise finished SRTM C-band 90 m DEM

Comments: DEM elevations are referenced to the TOPEX/Poseidon ellipsoid and are directly comparable to the elevation on the GLAS products.

Product Var Name i_DEMhiresArElv

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record

Short Description: DEMhiresArElv

Product Data Type: i2b (9, 40)

Total Bytes: 720

Product Units: meters

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -500

Product Maximum: 1300

Description: d_DEMhiresArElv is a 3 X 3 X 40 array of high resolution DEM values. The 1-40 index corresponds to 1/40 second samples. The 1-9 index corresponds to the position of the DEM value relative to the spot. Given the first 1/40 second of data, positional correspondence of the DEM element to the spot is as follows:

The 9 points on the product correspond to the 3x3 points in the alg variable as follows:

gla06%d_DEMhiresArElv(1,1,k) = gla06_prod%i_DEMhiresArElv(1,k) NW

gla06%d_DEMhiresArElv(2,1,k) = gla06_prod%i_DEMhiresArElv(2,k) N

gla06%d_DEMhiresArElv(3,1,k) = gla06_prod%i_DEMhiresArElv(3,k) NE

gla06%d_DEMhiresArElv(1,2,k) = gla06_prod%i_DEMhiresArElv(4,k) W

gla06%d_DEMhiresArElv(2,2,k) = gla06_prod%i_DEMhiresArElv(5,k) center

gla06%d_DEMhiresArElv(3,2,k) = gla06_prod%i_DEMhiresArElv(6,k) E

gla06%d_DEMhiresArElv(1,3,k) = gla06_prod%i_DEMhiresArElv(7,k) SW

gla06%d_DEMhiresArElv(2,3,k) = gla06_prod%i_DEMhiresArElv(8,k) S

gla06%d_DEMhiresArElv(3,3,k) = gla06_prod%i_DEMhiresArElv(9,k) SE

Comments:

Product Var Name i_ElevBiasCorr

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Elevation Bias Correction

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: mm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: NA

Product Minimum: 0

Product Maximum: 3000

Description: Correction to elevation based on post flight analysis for biases determined for each campaign. This bias correction has not been applied to the data so to apply it SUBTRACT the correction from the range estimate. To apply the correction to the elevations it must be ADDED to the elevation estimates.

Comments: See the altimeter user guide for full description.

Product Var Name i_spare42

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Spare 42

Product Data Type: i2b (4, 40)

Total Bytes: 320

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: n/a

Product Maximum: n/a

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: Spare 42

Product Var Name i_sigmaatt

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Attitude Quality Indicator

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: Unitless

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 6000

Description: Attitude quality indicator. Values: 0=good; 50=warning; 100=bad.

Comments: This indicator currently has only 3 values: 0, 50, and 100, leaving open the opportunity to use numbers in between for further resolution of the degradation as our knowledge improves.

Product Var Name i_Azimuth

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Local Azimuth

Product Data Type: i4b

Total Bytes: 4

Product Units: millideg

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 360000

Description: Mean azimuth measured clockwise from north based on latitude, longitude, and elevation of a 1 second interval of the trace of the ground footprint-center.

Comments:

Product Var Name i_SolAng

Is element of: GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Solar Angle

Product Data Type: i4b

Total Bytes: 4

Product Units: microdeg

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -90000000

Product Maximum: 90000000

Description: Solar Angle above or below the plane tangent to the ellipsoid surface at the laser spot. Positive values mean the sun is above the horizon, while negative values mean it is below the horizon. The effect of atmospheric refraction is not included. This is a low-precision value, with approximately one degree accuracy.

Comments:

Product Var Name i_tpintensity_avg

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Transmit Pulse intensity - frame avg

Product Data Type: i4b

Total Bytes: 4

Product Units: counts

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 25500

Description: Transmit pulse intensity as measured by the LPA. Average over the 1-second frame. From ANC09.

Comments:

Product Var Name i_tpazimuth_avg

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Transmit Pulse azimuth - frame avg

Product Data Type: i2b

Total Bytes: 2

Product Units: degrees*10

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 3600

Description: Transmit pulse azimuth. Average over the 1-second frame. Angle eastwards from north of the major axis of the transmit pulse, as seen by the LPA. From ANC09.

Comments:

Product Var Name i_tpeccentricity_avg

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Transmit Pulse eccentricity - frame avg

Product Data Type: i2b

Total Bytes: 2

Product Units: Unitless*1000

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1000

Description: Transmit pulse eccentricity as measured by the LPA. Average over the 1-second frame. From ANC09.

Comments:

Product Var Name i_tpmajoraxis_avg

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Transmit Pulse major axis - frame avg

Product Data Type: i2b

Total Bytes: 2

Product Units: cm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 10000

Description: Transmit pulse major axis as measured by the LPA. Average over the 1-second time frame. From ANC09.

Comments:

Product Var Name i_poTide

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Pole Tide

Product Data Type: i2b

Total Bytes: 2

Product Units: mm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -10000

Product Maximum: 10000

Description: Pole tide: an ocean tide which is the result of the Chandler

wobble (a free nutation of the Earth caused by fluctuating

pressure on the bottom of the ocean, caused by temperature

and salinity changes and wind-driven changes in the circulation
of the oceans).
Comments:

Product Var Name i_gdHt
Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: Geoid
Product Data Type: i2b (2)
Total Bytes: 4
Product Units: cm
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -20000
Product Maximum: 20000
Description: The height of the geoid above the ellipsoid for the first and last shot in the record.
Comments:

Product Var Name i_erElv
Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: Solid Earth Tide Elevation (at first & last shot)
Product Data Type: i2b (2)
Total Bytes: 4
Product Units: mm
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -10000
Product Maximum: 10000
Description: The solid earth tide elevation for the first & last shot in the record.
Comments:

Product Var Name i_spElv
Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: Tide Elevations, Specific
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: mm
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -10000

Product Maximum: 10000

Description: A tide elevation calculated from alternate tide models for specific regions for shots 1, 11, 21, and 31.

Comments:

Product Var Name i_ldElv

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Load Tide Elevation

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: mm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -10000

Product Maximum: 10000

Description: The load tide elevation applied to each shot. Elements 1-4 of the load tide vector are applied to shots 1-10, 11-20, 21-30, and 31-40, respectively.

Comments: The load tide is NOT NECESSARILY the load tide for shots 1,11,21,31. It is calculated for the first valid shot in each group of 10 and applied to all valid shots in the group.

Product Var Name i_spare12

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record

Short Description: Spares 12

Product Data Type: i2b (2)

Total Bytes: 4

Product Units: N/A

Invalid Value/Flag: None

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_wTrop

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Range Correction_Wet Troposphere

Product Data Type: i2b (2)

Total Bytes: 4

Product Units: mm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -1000

Product Maximum: 0

Description: The range correction due to the wet troposphere at first & last shot.

Comments:

Product Var Name i_dTrop

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA15 Record

Short Description: Range Correction, Dry Troposphere

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: mm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -2500

Product Maximum: 0

Description: The range correction due to the dry troposphere; one correction for each shot.Validity is based on results of finding a range with the standard fit.

Comments:

Product Var Name i_surfType

Is element of: GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Region Type

Product Data Type: i1b

Total Bytes: 1

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 1

Product Maximum: 15

Description: Describes the region type or types associated with each shot Ice Sheet, ocean, sea ice, or Land.

Please see <a href='flags/i_surfType.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_spare11

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record

Short Description: Spare 11

Product Data Type: i1b (3)

Total Bytes: 3

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: n/a

Product Maximum: n/a

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_DEM_elv

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record

Short Description: DEM Elevation

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: cm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -50000

Product Maximum: 1000000

Description: Elevation at the footprint location from the SRTM30 (GTOPO30 + SRTM) Digital Elevation Model (DEM). The reference frame for the DEM elevation was changed to the TOPEX/Poseidon ellipsoid to make it consistent with the GLAS elevations.

Comments:

Product Var Name i_refRng

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Reference Range

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 400000000

Product Maximum: 1000000000

Description: Range in distance calculated from the time between the centroid of the transmit pulse and the farthest gate from the spacecraft of the received pulse. See the rngcorrflg to determine any corrections that have been applied.

Comments:

Product Var Name i_TrshRngOff

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA15 Record

Short Description: Threshold Retracker Range Offset

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -150000

Product Maximum: 0

Description: Offset to be added to i_refRng to give the range in distance to the threshold retracker location on the received echo using standard parameters.

Comments:

Product Var Name i_siRngOff

Is element of: GLA06 record, GLA13 Record

Short Description: Sea Ice Range Offset

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -150000

Product Maximum: 0

Description: Range offset to be added to i_refRng to calculate the range using the algorithm deemed appropriate for sea ice.

Comments:

Product Var Name i_SigEndOff

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA15 Record

Short Description: Signal End Range Offset

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -150000

Product Maximum: 0

Description: Offset to be added to i_refRng to give the range in distance to the location on the received echo calculated as the end of signal (farthest from the spacecraft) using standard parameters.

Comments:

Product Var Name i_cntRngOff

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA15 Record

Short Description: Centroid Range Offset

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -150000

Product Maximum: 0

Description: Offset to be added to i_refRng to give the range in distance to the location of the centroid of the received echo from signal begin through signal end defined by the standard parameters.

Comments:

Product Var Name i_reflctUC

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: reflctUC

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: Unitless*1E06

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1000000

Description: Reflectivity, not corrected for atmospheric effects, is calculated as Refl = R/T, where R is the received energy after it has been scaled for range, and T is the transmitted energy. i_reflctUC has also been calibrated for gain non-linearity (only for non-saturated waveforms), ground truth calibration and boresight shift shadowing (BSS). It is not corrected for saturation effects. If the shot is saturated (satindex above 2) then to correct for saturation the reflectivity estimate needs to be multiplied by the ratio of the corrected energy to the uncorrected energy (sat corrected reflectivity = i_reflctUC * (i_RecNrgAll + i_satNrgCorr)/i_RecNrgAll)

The atmospheric corrected reflectivity may be calculated from this uncorrected reflectivity by multiplying it by d_reflCor_atm.

i_reflctUC is invalid where GLA06%d_satNrgCorr is invalid.

Comments: This uses all signal between signal begin and signal end.

Product Var Name i_reflCor_atm

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Reflectivity Correction Factor For Atmospheric Effects

Product Data Type: i4b

Total Bytes: 4

Product Units: Unitless

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 1

Product Maximum: 250

Description: This reflectance correction factor is calculated as 1 / e^(-2(tc+ta+tp+tm)), where tc is the cloud (column) integrated optical depth, ta is the aerosol (column) integrated optical depth, tp is the planetary boundary layer optical depth, and tm is the molecular optical depth. tm is a constant equal to -log(gd_T_RTatm)/2, where gd_T_RTatm = 0.98 is defined in const_elev_mod.f90 or read from ANC07-03. The attenuation correction factor has been corrected for multiple scattering. The reflectance has been corrected for waveform saturation.

Comments:

Product Var Name i_maxSmAmp

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Peak Amplitude of Smoothed Received Echo

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: Tenth of millivolts

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -300

Product Maximum: 30000

Description: The peak amplitude of the received echo after it has been smoothed to remove high frequency noise (see ATBD).

Comments: This is calculated after converting the return to voltage.

Product Var Name i_ocElv

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Ocean Tide Elevation

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: mm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -10000

Product Maximum: 10000

Description: The ocean tide elevation from the TPX07.1 tide model.

Comments:

Product Var Name i_numPk

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA15 Record

Short Description: Number of Peaks found in the Return

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 6

Description: The number of peaks in the return echo found by the Gaussian fitting procedure, using standard parameters.

Comments:

Product Var Name i_kurt2

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA15 Record

Short Description: Kurtosis of the Received Echo (standard)

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: unitless * 100

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -1000

Product Maximum: 1000

Description: Kurtosis of the received echo from signal begin to signal end using standard parameters

Comments: Note that the received echo was calibrated and converted to voltage before calculation.

Product Var Name i_skew2

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA15 Record

Short Description: Skewness

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: unitless * 100

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -10000

Product Maximum: 10000

Description: The skewness of the received echo from signal begin to signal end using standard parameters.

Comments: Note that the received echo was calibrated and converted to voltage before calculation.

Product Var Name i_spare4

Is element of: GLA13 Record

Short Description: Spare 4

Product Data Type: i1b (160)

Total Bytes: 160

Product Units: null

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_BergElev

Is element of: GLA13 Record

Short Description: Iceberg Elevation

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 200000

Description: For waveforms with more than 1 peak, 'iceberg' elevation is calculated using the difference between the range offset of the maximum amplitude peak and the range offset of the first peak. Computations are made after atmospheric and tide corrections have been applied. The elevation computed is relative to the ellipsoid.

Comments: Users should be wary that this parameter is computed for all multiple-peak GLA13 records, even if the elevation is too high to be sea-ice.

Product Var Name i_spare10

Is element of: GLA13 Record

Short Description: Spare 10

Product Data Type: i1b (160)

Total Bytes: 160

Product Units: null

Invalid Value/Flag: No

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: GLA13 spare10.

Product Var Name i_SiRngFst

Is element of: GLA13 Record

Short Description: Sea ice range increment to first peak

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -150000

Product Maximum: 0

Description: Range increment to be added to reference range to compute the sea ice specific range. This was determined from centroid of first peak in sea ice Gaussian fit

Comments:

Product Var Name i_SeaIceVar

Is element of: GLA13 Record

Short Description: Standard Deviation of the sea ice Gaussian fit

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: millivolts

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 25500

Description: The Standard deviation of the difference between the functional fit and the received echo using standard parameters. It is directly taken from GLA05 parameter d_wfFitSDev_2 (standard).

Comments:

Product Var Name i_ElvuseFlg

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Elevation use flag

Product Data Type: i1b (5)

Total Bytes: 5

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -127

Product Maximum: 127

Description: Flag indicating whether the elevations on this record should be used or not (1 bit set/shot). See the <a href='flags/i_ElvuseFlg.pdf'>PDF file</A> for more information.

Comments:

Product Var Name i_atm_avail

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Atmosphere Availability Flag

Product Data Type: i1b

Total Bytes: 1

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 15

Description: Please see <a href='flags/i_atm_avail.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_spare16

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Spare 16

Product Data Type: i1b (4)

Total Bytes: 4

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: n/a

Product Maximum: n/a

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_cld1_mswf

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Cloud Multiple Scattering Warning Flag

Product Data Type: i1b

Total Bytes: 1

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 15

Description: The multiple scattering warning flag (MSWF) is based on the total column optical depth (aerosol plus cloud) calculated in GLA11 using 532nm. It is intended as a way to quickly obtain information about the potential severity of multiple scattering with regards to the range-to-surface calculated by the altimetry processing software. It will be output on the GLA11 product for use by the altimetry group. The multiple scattering warning flag will have values ranging from 0-14, based on the total column optical depth as detailed in the PDF.

A warning flag value of 15 will signify ?invalid?. An invalid will be encoded if an optical depth in any of the layers in the 1-second column could not be calculated. This usually occurs in a very optically ?thick? cloud which extinguishes the signal. It could also occur if the extinction-to-backscatter ratio assignment is set too high, causing the transmission calculations in the lidar inversion to go out-of-range.Please see <a href='flags/i_cld1_mswf_elv.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_MRC_af

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Medium Resolution Cloud Availability Flag

Product Data Type: i1b

Total Bytes: 1

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 15

Description: Tells how many cloud layers were found at this resolution from the 532 nm channel. Please see <a href='flags/i_MRC_af.pdf'> the PDF flag description in the next section for more details. This parameter is extracted from the i_MRCL_flag on GLA09.

Comments:

Product Var Name i_spare9

Is element of: GLA13 Record

Short Description: spares

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: null

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_ElvFlg

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Elevation Definition Flag

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 127

Description: Indicates how location on the received echo was determined to calculate the elevation on the record.

Please see <a href='flags/i_ElvFlg.pdf'> the PDF flag description in the next section for more details. 'For GLA05, 06 and 12,13,14 and 15, bits are set to reflect the range offset used for that products elevation. Although defined as a pass-thru, the values are different on GLA06/12,13,15 and GLA14.'

Comments:

Product Var Name i_rng_UQF

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Range Offset Quality/Use Flag

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: Data quality flag for the range offsets on this record.

Please see <a href='flags/i_rng_UQF.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_spare49

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Spare 49

Product Data Type: i1b (10)

Total Bytes: 10

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_timecorflg

Is element of: GLA01 Main Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: time correction flag

Product Data Type: i2b

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: Indicates what instrument or bias corrections were applied to the times on this record. Please see <a href='flags/i_timecorflg.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_APID_AvFlg

Is element of: GLA01 Main Record, GLA02 Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: APID Data Availability Flag

Product Data Type: i1b (8)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -127

Product Maximum: 127

Description: Flag indicating which packets (APIDs) for each second are available missing, or filled. APID 19 is broken down further into Altimeter Digitizer, Photon Counter, Cloud Digitizer, GPS/DEM, and C&T sections.

Please see the PDF flag description in the next section for more details.

Comments:

Product Var Name i_AttFlg2

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Attitude Flag 2

Product Data Type: i1b (20)

Total Bytes: 20

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 15

Description: Denotes at 40/sec rate whether precision attitude was used to determine spot location, and if problems with LPA, etc.

Please see <a href='flags/i_AttFlg2.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_spare5

Is element of: GLA13 Record

Short Description: Spare 5

Product Data Type: i1b

Total Bytes: 1

Product Units: NA

Invalid Value/Flag: N/A

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_FrameQF

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Altimeter Frame Quality Flag

Product Data Type: i1b

Total Bytes: 1

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1

Description: Denotes all bad data (no signal in whole frame), or all data good and all science team recommended corrections applied

Please see <a href='flags/i_FrameQF.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_OrbFlg

Is element of: GLA01 Main Record, GLA02 Record, GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: POD flag (Orbit Flag)

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 128

Description: Denotes quality of orbit, whether predicted or precision, loss of GPS data, maneuver-degraded, etc.

Please see <a href='flags/i_OrbFlg.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_rngCorrFlg

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Range Correction Flag

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: Denotes which geophysical or instrument corrections have been applied to the range in the calculation of the elevation on this record.

Please see <a href='flags/i_rngCorrFlg.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_CorrStatFlg

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Correction Status Flag

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: For each geophysical correction that has multiple values denotes which algorithm or model was used.

Please see <a href='flags/i_CorrStatFlg.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_spare15

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Spare 15

Product Data Type: i1b (8)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: n/a

Product Maximum: n/a

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.Comments:

Product Var Name i_AttFlg1

Is element of: GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Attitude Flag 1

Product Data Type: i2b

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: At 1/sec denotes large off-nadir angle, ocn sweep, target of opportunity, steering to reference track.

Please see <a href='flags/i_AttFlg1.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_Spare6

Is element of: GLA13 Record

Short Description: Spare 6

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: GLA13 spare6.

Product Var Name i_spare44

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record

Short Description: Spare 44

Product Data Type: i1b (120)

Total Bytes: 120

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: n/a

Product Maximum: n/a

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_satNdx

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Saturation Index

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: ns

Invalid Value/Flag: gi_invalid_i1b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 126

Description: The count of the number of gates in a waveform which have an amplitude greater than or equal to i_satNdxTh (set in anc07_0004). The value 126 means 126 or more gates are above the saturation index threshold (i_satNdxth).

Comments:

Product Var Name i_satElevCorr

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Saturation Elevation Correction

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: mm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 3000

Description: Correction to elevation for saturated waveforms. This correction has not been applied to the data so to apply it SUBTRACT the correction from the range estimate. To apply the correction to the elevations it must be ADDED to the elevation estimates.

Comments:

Product Var Name i_satCorrFlg

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Saturation Correction Flag

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: Yes

Is Unsigned?: NA

Product Minimum: NA

Product Maximum: NA

Description: Please see <a href='flags/i_satCorrFlg.pdf'> the PDF flag description in the next section for more details.

Bits 0-3: i_satElevCorr flag (4 bits); values indicated below:

0= Not Saturated (i_satNdx < 2) or No Signal

1= Sat. Correction is Inconsequential (i_satNdx >= 2 & i_pctSat < 2.0)

2= Sat. Correction is Applicable (i_satNdx >= 2 & i_pctSat >= 2.0 & Full Width* < 100ns)

3= Sat. Correction is Not Computable effects elevations can not be corrected

4= Sat. Correction model is Not Applicable so data can not be corrected (i_satNdx >= 2 & i_pctSat >= 2.0 & Full Width* >= 100ns) there are errors in the data but the effects on elevations can not be corrected

values 5-15=TBD

Bits 4-5: i_satNrgCorr flag (2 bits):

0=TBD

1=TBD

2=TBD

3=TBD

Bits 6-7: TBD:

0=TBD

1=TBD

2=TBD

3=TBD

Comments:

Product Var Name i_satNrgCorr

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Saturation Energy Correction

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: .01fJ

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 100

Description: Correction to energy for saturated waveforms. This correction has not been applied to the energy. It should be ADDED to any echo pulse energy calculated from the pulse area under the waveform. Also any reflectivity estimates need to be corrected for this error in energy measurement.

Comments:

Product Var Name i_spare13

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record

Short Description: Spare 13

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: null

Invalid Value/Flag: null

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_gval_rcv

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Gain Value used for Received Pulse

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: counts

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 255

Description: Gain value used for received pulse - uncalibrated.

Comments: This value is in counts and needs to be calibrated before calculating energy from it. Same as variable in GLA01_Long/i_gainSet1064.

Product Var Name i_RecNrgAll

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Received Energy signal begin to signal end

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: 0.01 fJoules

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32000

Description: This is a pass through of gla01%d_recNrgAll_EU, but stored in different units on the product. This is calculated by taking the area under the received waveform (referenced to the observed noise) from all responses between the noise crossing before the first threshold crossing and the noise crossing after the last threshold crossing. It is a rescaled value of GLA01 parameter d_recNrgAll_EU and is not recomputed.

Comments:

Product Var Name i_FRir_cldtop

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Full Resolution 1064 Cloud Top

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: deka-meters

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1030

Description: Full resolution (40 Hz) cloud top height obtained from the 1064 atmospheric channel. This parameter is for a 1 second record. This parameter is in GLA09.

Comments:

Product Var Name i_FRir_qaFlag

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Full Resolution 1064 Quality Flag

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 15

Description: One byte per data quality flag.

Value 15 = No clouds.

Value 14 = Indicates the likely presence of low clouds (< 150 m) based on elevated signal from the two bins above the ground return bin that were not detected directly by the cloud search algorithm. When this occurs, the 40 Hz cloud top height (i_Frir_cldtop) is set to a value of 0.10 km.

Value 13 = Indicates the possible presence of a cloud based on the value of the integrated signal parameter (i_FRir_intsig) that was not detected directly by the cloud search algorithm. When this occurs, the 40 Hz cloud top height (i_Frir_cldtop) is set to a value of 10.0 km.

Value 0 - 12 = Cloud detected by cloud search algorithm with higher numbers indicating a stronger average signal from the region starting at cloud top and extending 500 m below cloud top height. Please see <a href='flags/i_FRir_qaFlag.pdf'> the PDF flag description in the next section for more details. This parameter is extracted from the equivalent parameter on GLA09.

Comments:

Product Var Name i_atm_char_flag

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Atmosphere Characterization Flag

Product Data Type: i2b

Total Bytes: 2

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 10

Description: Flag to characterize cloud and blowing snow state of the atmosphere

0 clear

1 high cloud (> 5 km) low optical depth

2 high cloud (> 5 km), high optical depth

3 mid cloud (>2, <=5 km) low optical depth

4 mid cloud (>2, <=5 km) high optical depth

5 low cloud (> 500 m, <=2 km), low optical depth

6 low cloud (> 500 m, <=2 km), high optical depth

7 blowing snow or fog (< 500 m), low optical depth

8 blowing snow or fog (< 500 m), high optical depth

9 not tested

10 data quality insufficient to assign flag

Comments:

Product Var Name i_atm_char_conf

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Atmosphere Characterization Flag Confidence

Product Data Type: i2b

Total Bytes: 2

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 3

Description: Confidence level ascribed to the atmosphere characterization flag

Comments: 0 Not applicable (for contamination flag values of 9 or 10)

1 low confidence

2 reasonable confidence

3 high confidence

Product Var Name i_spare48

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Spare 48

Product Data Type: i1b (36)

Total Bytes: 36

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: n/a

Product Maximum: n/a

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_FRir_intsig

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Full Resolution 1064 Integrated Signal

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: e7/(m-sr)

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 10000

Description: Though called 'integrated signal' this is actually an average of all bins in the above-ground portion of the 1064 40 Hz profile with values above the threshold of 1.0e-7 (1/(m-sr) units). This parameter is for a 1 second record. This parameter is extracted from the equivalent parameter on GLA09.

Comments:

Product Var Name i_spare14

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Spare 14

Product Data Type: i1b (120)

Total Bytes: 120

Product Units: Unknown

Invalid Value/Flag: gi_invalid_i1b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_Surface_temp

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Surface Temperature

Product Data Type: i2b

Total Bytes: 2

Product Units: degrees Celsius * 100

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -10000

Product Maximum: 10000

Description: Atmospheric temperature at Earth's surface level measured in degrees Celsius and derived from the meteorological data files.

Comments:

Product Var Name i_Surface_pres

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Surface Pressure

Product Data Type: i2b

Total Bytes: 2

Product Units: hPa * 10

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 20000

Description: Atmospheric pressure at Earth's surface level measured in hPa and derived from the meteorological data files.

Comments:

Product Var Name i_Surface_relh

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Relative Humidity

Product Data Type: i2b

Total Bytes: 2

Product Units: percentage * 100

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 10000

Description: Atmospheric relative humidity at Earth's surface level measured as a percentage and derived from the meteorological data files.

Comments:

Product Var Name i_maxRecAmp

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Max Amplitude of Received Echo

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: Tenth of millivolts

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -300

Product Maximum: 30000

Description: Maximum Amplitude of the Received Echo.

Comments: This is calculated after converting the return to voltage. Use for scaling model fit RMS between normalized and un-normalized units.

Product Var Name i_sDevNsOb1

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Standard deviation of 1064 nm Background noise, (alternate)

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: 0.0001 volts

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 30000

Description: The standard deviation of the background noise (alternative parameters).

Comments: Can be used for computing signal-to-noise ratio along with unsmoothed max amplitude.

Product Var Name i_pctSAT

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Percent Saturation

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: percent

Invalid Value/Flag: gi_invalid_i1b

Is Correction Flag?: Yes

Is Unsigned?: NA

Product Minimum: -127

Product Maximum: 127

Description: Percent saturation (d_pctSAT) is calculated using the formula: d_pctSAT= 100*(saturation index)/(signal end - signal begin in nanoseconds). The alternate signal end/begin are used for GLA14%d_pctSAT, while the standard fit values are used for GLA06, 12, 13, and 15. The Saturation elevation correction is not applied in the geolocation processing computation of lat, lon and elev. Because the saturation corrections are small and data is acquired within 5 deg off nadir, effects on lat and lon can be ignored. To apply the saturation elevation correction to the elevations on the products it must be ADDED to the elevation estimates. Reported elevations for returns with invalid satElevCorr values and satCorrFlg values of 3 or 4 are likely to have large, uncorrectable errors and should be excluded from analyses.

Comments:

Product Var Name i_TxNrg

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: 1064 nm Laser Transmit Energy

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: 0.01 millijoules

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32766

Description: The 1064 nm laser pulse transmitted energy in energy units, computed from the digitized outgoing pulse, and the transmit gain.

Comments:

Product Var Name i_eqElv

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Equilibrium Tide Elevation (at first & last shot)

Product Data Type: i2b (2)

Total Bytes: 4

Product Units: mm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: NA

Product Minimum: -10000

Product Maximum: 10000

Description: The equilibrium (long period) tide at first and last valid shot over the ocean.

Comments:

Product Var Name i_Spare7

Is element of: GLA06 record, GLA12 Record, GLA13 Record

Short Description: Spare 7

Product Data Type: i1b (282)

Total Bytes: 282

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: GLA06, GLA12, GLA13 spare7.

Product Var Name i_rec_ndx

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: GLAS Record Index

Product Data Type: i4b

Total Bytes: 4

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: Unique index that relates this record to the corresponding record(s) in each GLAS data product.

Comments:

Product Var Name i_UTCTime

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Transmit Time of First Shot in frame in J2000

Product Data Type: i4b (2)

Total Bytes: 8

Product Units: seconds, microseconds

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: The transmit time of the first shot in the 1 second frame measured as 'UTC seconds' elapsed since Jan 1 2000 12:00:00 UTC. This time has been derived from the GPS time accounting for leap seconds. The first item is the whole number of seconds; the second item is the fractional part in microseconds.

Comments: This is not the ground bounce time, but the transmit time.

Product Var Name i_transtime

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: One way transit time

Product Data Type: i2b

Total Bytes: 2

Product Units: microseconds

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 4000

Description: One way transit time calculated using the preliminary range offset. This is added to the UTC time tag to get the ground bounce times at which to calculate the orbit

Comments:

Product Var Name i_Spare1

Is element of: GLA14 Record

Short Description: Spare 1

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: GLA14 spare1.

Product Var Name i_deltagpstmcor

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Delta GPS time correction

Product Data Type: i4b

Total Bytes: 4

Product Units: nanoseconds

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -1000000

Product Maximum: 1000000

Description: The high frequency delta GPS time correction calculated during the precision orbit processing step.

Comments:

Product Var Name i_dShotTime

Is element of: GLA01 Main Record, GLA04 LPA Main Record, GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Laser Shot Time Deltas (shots 2-40)

Product Data Type: i4b (39)

Total Bytes: 156

Product Units: microseconds

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1200000

Description: The time deltas of pulses 2 through 40 to i_UTCTime, the UTC time tag of the first pulse in the 1-second data frame. Adding the deltas to i_UTCTime will give the user the time of each individual shot in the frame.

Comments: To calculate the time for shots 2-40, add these deltas to the time of the first shot.

Product Var Name i_lat

Is element of: GLA14 Record

Short Description: Coordinate Data, Latitude, specific to land range

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: microdeg

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -90000000

Product Maximum: 90000000

Description: The geodetic latitude of the forty laser spots in the 1 second time frame, computed from the Precision orbit determined GLAS laser antenna ground nadir coordinates, precision attitude, and land-specific range after all instrument corrections, atmospheric delays and tides have been applied. The values are in degrees North.

Comments:

Product Var Name i_lon

Is element of: GLA14 Record

Short Description: Coordinate Data, Longitude, specific to land range

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: microdeg

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 360000000

Description: The longitude of the forty laser spots in the 1 second time frame, computed from the Precision orbit determined GLAS laser antenna ground nadir coordinates, precision attitude, and land-specific range after all instrument corrections, atmospheric delays and tides have been applied. The values are in east longitude.

Comments:

Product Var Name i_elev

Is element of: GLA14 Record

Short Description: Land surface Elevation

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -500000

Product Maximum: 10000000

Description: Surface elevation with respect to the ellipsoid at the spot location determined by range using the land-specific fitting procedure after all instrument corrections, atmospheric delays and tides have been applied.

Comments:

Product Var Name i_campaign

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Campaign

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: INT(ICHAR(1A))

Product Maximum: INT(ICHAR(3K))

Description: The campaign. ie: for campaign L1A, it will be '1A'.Comments:

Product Var Name i_spare40

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Spare 40

Product Data Type: i2b

Total Bytes: 2

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: n/a

Product Maximum: n/a

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: Spare 40.

Product Var Name i_cycTrk

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Cycle and Track

Product Data Type: i4b

Total Bytes: 4

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 10001

Product Maximum: 9991354

Description: The track and cycle. On the product, they will be stored as one number: ccctttt.

Comments:

Product Var Name i_localSolarTime

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Local apparent solar time

Product Data Type: i4b

Total Bytes: 4

Product Units: seconds*1000

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 86400000

Description: Local apparent solar time.

Comments:

Product Var Name i_spare41

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Spare 41

Product Data Type: i4b (7)

Total Bytes: 28

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: n/a

Product Maximum: n/a

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: Spare 41.

Product Var Name i_deltaEllip

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Delta Ellipsoid

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: mm

Invalid Value/Flag: n/a

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -9000

Product Maximum: 9000

Description: Surface Elevation (T/P ellipsoid) minus Surface Elevation(WGS84 ellipsoid).

Comments:

Product Var Name i_beamCoelv

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Co-elevation

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: degrees*100

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 36000

Description: Co-elevation (CE) is direction from vertical of the laser beam as seen by an observer located at the laser ground spot. 40Hz.

Comments:

Product Var Name i_beamAzimuth

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Azimuth

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: degrees*100

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 36000

Description: The direction, eastwards from north, of the laser beam vector as seen by an observer at the laser ground spot viewing toward the spacecraft (i.e., the vector from the ground to the spacecraft). When the spacecraft is precisely at the geodetic zenith, the value will be 99999 degrees. 40 Hz.

Comments:

Product Var Name i_d2refTrk

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Distance to the reference ground track

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: m*1000

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1000000000

Description: Distance to the reference ground track.

Comments:

Product Var Name i_SigBegOff

Is element of: GLA14 Record

Short Description: Signal Begin Range Increment

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -150000

Product Maximum: 0

Description: Range increment to be added to reference range to obtain signal begin as computed in ground process using the alternate parameterization.

Comments:

Product Var Name i_DEM_hires_src

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record

Short Description: High Resolution Source Flag

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 128

Description: Flag to specify who the source provider was for the high resolution DEM.

0 = no high res source available

1 = unfinished research Shuttle Radar Topography Mission (SRTM)

        C-band 90 m DEM produced by JPL (+-1.1km E-W swath)

2 = finished SRTM C-band 90 m DEM produced by NGA (+-2.1km E-W swath)

3 = ICESat Greenland V1 1km DEM

4 = ICESat Antarctica V1 500m DEM

5 = 90m Canadian Digital Elevation Data (CDED)

6 = 90m Canadian Digital Elevation Data (CDED) if available otherwise finished SRTM C-band 90 m DEM

Comments: DEM elevations are referenced to the TOPEX/Poseidon ellipsoid and are directly comparable to the elevation on the GLAS products.

Product Var Name i_DEMhiresArElv

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record

Short Description: DEMhiresArElv

Product Data Type: i2b (9, 40)

Total Bytes: 720

Product Units: meters

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -500

Product Maximum: 1300

Description: d_DEMhiresArElv is a 3 X 3 X 40 array of high resolution DEM values. The 1-40 index corresponds to 1/40 second samples. The 1-9 index corresponds to the position of the DEM value relative to the spot. Given the first 1/40 second of data, positional correspondence of the DEM element to the spot is as follows:

The 9 points on the product correspond to the 3x3 points in the alg variable as follows:

gla06%d_DEMhiresArElv(1,1,k) = gla06_prod%i_DEMhiresArElv(1,k) NW

gla06%d_DEMhiresArElv(2,1,k) = gla06_prod%i_DEMhiresArElv(2,k) N

gla06%d_DEMhiresArElv(3,1,k) = gla06_prod%i_DEMhiresArElv(3,k) NE

gla06%d_DEMhiresArElv(1,2,k) = gla06_prod%i_DEMhiresArElv(4,k) W

gla06%d_DEMhiresArElv(2,2,k) = gla06_prod%i_DEMhiresArElv(5,k) center

gla06%d_DEMhiresArElv(3,2,k) = gla06_prod%i_DEMhiresArElv(6,k) E

gla06%d_DEMhiresArElv(1,3,k) = gla06_prod%i_DEMhiresArElv(7,k) SW

gla06%d_DEMhiresArElv(2,3,k) = gla06_prod%i_DEMhiresArElv(8,k) S

gla06%d_DEMhiresArElv(3,3,k) = gla06_prod%i_DEMhiresArElv(9,k) SE

Comments:

Product Var Name i_ElevBiasCorr

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Elevation Bias Correction

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: mm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: NA

Product Minimum: 0

Product Maximum: 3000

Description: Correction to elevation based on post flight analysis for biases determined for each campaign. This bias correction has not been applied to the data so to apply it SUBTRACT the correction from the range estimate. To apply the correction to the elevations it must be ADDED to the elevation estimates.

Comments: See the altimeter user guide for full description.

Product Var Name i_spare42

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Spare 42

Product Data Type: i2b (4, 40)

Total Bytes: 320

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: n/a

Product Maximum: n/a

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: Spare 42

Product Var Name i_sigmaatt

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Attitude Quality Indicator

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: Unitless

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 6000

Description: Attitude quality indicator. Values: 0=good; 50=warning; 100=bad.

Comments: This indicator currently has only 3 values: 0, 50, and 100, leaving open the opportunity to use numbers in between for further resolution of the degradation as our knowledge improves.

Product Var Name i_Azimuth

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Local Azimuth

Product Data Type: i4b

Total Bytes: 4

Product Units: millideg

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 360000

Description: Mean azimuth measured clockwise from north based on latitude, longitude, and elevation of a 1 second interval of the trace of the ground footprint-center.

Comments:

Product Var Name i_SolAng

Is element of: GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Solar Angle

Product Data Type: i4b

Total Bytes: 4

Product Units: microdeg

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -90000000

Product Maximum: 90000000

Description: Solar Angle above or below the plane tangent to the ellipsoid surface at the laser spot. Positive values mean the sun is above the horizon, while negative values mean it is below the horizon. The effect of atmospheric refraction is not included. This is a low-precision value, with approximately one degree accuracy.

Comments:

Product Var Name i_tpintensity_avg

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Transmit Pulse intensity - frame avg

Product Data Type: i4b

Total Bytes: 4

Product Units: counts

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 25500

Description: Transmit pulse intensity as measured by the LPA. Average over the 1-second frame. From ANC09.

Comments:

Product Var Name i_tpazimuth_avg

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Transmit Pulse azimuth - frame avg

Product Data Type: i2b

Total Bytes: 2

Product Units: degrees*10

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 3600

Description: Transmit pulse azimuth. Average over the 1-second frame. Angle eastwards from north of the major axis of the transmit pulse, as seen by the LPA. From ANC09.

Comments:

Product Var Name i_tpeccentricity_avg

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Transmit Pulse eccentricity - frame avg

Product Data Type: i2b

Total Bytes: 2

Product Units: Unitless*1000

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1000

Description: Transmit pulse eccentricity as measured by the LPA. Average over the 1-second frame. From ANC09.

Comments:

Product Var Name i_tpmajoraxis_avg

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Transmit Pulse major axis - frame avg

Product Data Type: i2b

Total Bytes: 2

Product Units: cm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 10000

Description: Transmit pulse major axis as measured by the LPA. Average over the 1-second time frame. From ANC09.

Comments:

Product Var Name i_poTide

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Pole Tide

Product Data Type: i2b

Total Bytes: 2

Product Units: mm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -10000

Product Maximum: 10000

Description: Pole tide: an ocean tide which is the result of the Chandler
wobble (a free nutation of the Earth caused by fluctuating
pressure on the bottom of the ocean, caused by temperature
and salinity changes and wind-driven changes in the circulation
of the oceans).

Comments:

Product Var Name i_gdHt

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Geoid

Product Data Type: i2b (2)

Total Bytes: 4

Product Units: cm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -20000
Product Maximum: 20000
Description: The height of the geoid above the ellipsoid for the first and last shot in the record.
Comments:

Product Var Name i_erElv
Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: Solid Earth Tide Elevation (at first & last shot)
Product Data Type: i2b (2)
Total Bytes: 4
Product Units: mm
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -10000
Product Maximum: 10000
Description: The solid earth tide elevation for the first & last shot in the record.
Comments:

Product Var Name i_spElv
Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: Tide Elevations, Specific
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: mm
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -10000
Product Maximum: 10000
Description: A tide elevation calculated from alternate tide models for specific regions for shots 1, 11, 21, and 31.
Comments:

Product Var Name i_ldElv
Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: Load Tide Elevation
Product Data Type: i2b (4)
Total Bytes: 8

Product Units: mm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -10000

Product Maximum: 10000

Description: The load tide elevation applied to each shot. Elements 1-4 of the load tide vector are applied to shots 1-10, 11-20, 21-30, and 31-40, respectively.

Comments: The load tide is NOT NECESSARILY the load tide for shots 1,11,21,31. It is calculated for the first valid shot in each group of 10 and applied to all valid shots in the group.

Product Var Name i_spare12

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record

Short Description: Spares 12

Product Data Type: i2b (2)

Total Bytes: 4

Product Units: N/A

Invalid Value/Flag: None

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_wTrop

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Range Correction_Wet Troposphere

Product Data Type: i2b (2)

Total Bytes: 4

Product Units: mm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -1000

Product Maximum: 0

Description: The range correction due to the wet troposphere at first & last shot.

Comments:

Product Var Name i_dTrop

Is element of: GLA14 Record

Short Description: Range Correction, Dry Troposphere

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: mm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -2500

Product Maximum: 0

Description: Atmospheric dry tropospheric delay correction added to the elevation. Validity is based on results of finding a range with the alternate fit.

Comments:

Product Var Name i_surfType

Is element of: GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Region Type

Product Data Type: i1b

Total Bytes: 1

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 1

Product Maximum: 15

Description: Describes the region type or types associated with each shot Ice Sheet, ocean, sea ice, or Land.

Please see <a href='flags/i_surfType.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_spare11

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record

Short Description: Spare 11

Product Data Type: i1b (3)

Total Bytes: 3

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: n/a

Product Maximum: n/a

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_DEM_elv

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record

Short Description: DEM Elevation

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: cm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -50000

Product Maximum: 1000000

Description: Elevation at the footprint location from the SRTM30 (GTOPO30 + SRTM) Digital Elevation Model (DEM). The reference frame for the DEM elevation was changed to the TOPEX/Poseidon ellipsoid to make it consistent with the GLAS elevations.

Comments:

Product Var Name i_refRng

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Reference Range

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 400000000

Product Maximum: 1000000000

Description: Range in distance calculated from the time between the centroid of the transmit pulse and the farthest gate from the spacecraft of the received pulse. See the rngcorrflg to determine any corrections that have been applied.

Comments:

Product Var Name i_spare47

Is element of: GLA06 record, GLA14 Record

Short Description: Spare 47

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: n/a

Product Maximum: n/a

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information

.Comments:

Product Var Name i_ldRngOff

Is element of: GLA06 record, GLA14 Record

Short Description: Land Range Offset

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -150000

Product Maximum: 0

Description: Range offset to be added to i_refRng to calculate the range using the algorithm deemed appropriate for land.

Comments:

Product Var Name i_SigEndOff

Is element of: GLA14 Record

Short Description: Signal End Range Increment

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -150000

Product Maximum: 0

Description: Range increment to be added to reference range to signal end as computed in ground process using the alternate parameterization.

Comments:

Product Var Name i_gpCntRngOff

Is element of: GLA14 Record

Short Description: Centroid Range Increment for all 6 peaks

Product Data Type: i4b (6, 40)

Total Bytes: 960

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -150000

Product Maximum: 0

Description: (Centroid Range Increment for all 6 peaks) is the array that contains the offsets of the Gaussian peaks with respect to the centroid range (Peak 6 to Peak 1, if you want from highest to lowest, first one is closest to the ground).

Centroid Range is the sum of reference range and Land range offset (which should be same as the centroid range offset).

Comments:

Product Var Name i_reflctUC

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: reflctUC

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: Unitless*1E06

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1000000

Description: Reflectivity, not corrected for atmospheric effects, is calculated as Refl = R/T, where R is the received energy after it has been scaled for range, and T is the transmitted energy. i_reflctUC has also been calibrated for gain non-linearity (only for non-saturated waveforms), ground truth calibration and boresight shift shadowing (BSS). It is not corrected for saturation effects. If the shot is saturated (satindex above 2) then to correct for saturation the reflectivity estimate needs to be multiplied by the ratio of the corrected energy to the uncorrected energy (sat corrected reflectivity = i_reflctUC * (i_RecNrgAll + i_satNrgCorr)/i_RecNrgAll)

The atmospheric corrected reflectivity may be calculated from this uncorrected reflectivity by multiplying it by d_reflCor_atm.

i_reflctUC is invalid where GLA06%d_satNrgCorr is invalid.

Comments: This uses all signal between signal begin and signal end.

Product Var Name i_reflCor_atm

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Reflectivity Correction Factor For Atmospheric Effects

Product Data Type: i4b

Total Bytes: 4

Product Units: Unitless

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 1

Product Maximum: 250

Description: This reflectance correction factor is calculated as 1 / e^(-2(tc+ta+tp+tm)), where tc is the cloud (column) integrated optical depth, ta is the aerosol (column) integrated optical depth, tp is the planetary boundary layer optical depth, and tm is the molecular optical depth. tm is a constant equal to -log(gd_T_RTatm)/2, where gd_T_RTatm = 0.98 is defined in const_elev_mod.f90 or read from ANC07-03. The attenuation correction factor has been corrected for multiple scattering. The reflectance has been corrected for waveform saturation.

Comments:

Product Var Name i_maxSmAmp

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Peak Amplitude of Smoothed Received Echo

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: Tenth of millivolts

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -300

Product Maximum: 30000

Description: The peak amplitude of the received echo after it has been smoothed to remove high frequency noise (see ATBD).

Comments: This is calculated after converting the return to voltage.

Product Var Name i_ocElv

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Ocean Tide Elevation

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: mm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -10000

Product Maximum: 10000

Description: The ocean tide elevation from the TPX07.1 tide model.

Comments:

Product Var Name i_numPk

Is element of: GLA14 Record

Short Description: Number of Peaks found in the Return

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 6

Description: The number of peaks in the waveform produced by the Gaussian filtering, using alternate parameters.

Comments:

Product Var Name i_kurt1

Is element of: GLA05 record, GLA14 Record

Short Description: Kurtosis of Received Echo (alternative)

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: unitless * 100

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -1000

Product Maximum: 1000

Description: Kurtosis of the received echo from signal begin to signal end using alternative parameters

Comments: Note that the received echo was calibrated and converted to voltage before calculation.

Product Var Name i_skew1

Is element of: GLA05 record, GLA14 Record

Short Description: Skewness of Received Echo (alternative)

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: unitless * 100

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -10000

Product Maximum: 10000

Description: Skewness of the received echo from signal begin to signal end using alternative parameters

Comments: Note that the received echo was calibrated and converted to voltage before calculation.

Product Var Name i_spare4

Is element of: GLA06 record, GLA12 Record, GLA14 Record, GLA15 Record

Short Description: Spare 4

Product Data Type: i1b (160)

Total Bytes: 160

Product Units: null

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_Gamp

Is element of: GLA14 Record

Short Description: Amplitudes of Gaussians

Product Data Type: i4b (6, 40)

Total Bytes: 960

Product Units: 0.01 volts

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 300

Description: Amplitude of each Gaussian solved for (up to six), using the alternate parameters.

Comments:

Product Var Name i_Garea

Is element of: GLA14 Record

Short Description: Area under Gaussian

Product Data Type: i4b (6, 40)

Total Bytes: 960

Product Units: 0.01 volts * ns

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 348457

Description: Area under each of the Gaussians solved for (up to six), using alternate parameters.

Comments:

Product Var Name i_Gsigma

Is element of: GLA14 Record

Short Description: Sigma of Gaussians

Product Data Type: i4b (6, 40)

Total Bytes: 960

Product Units: 0.001 ns

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 327660

Description: Width (sigma) of each Gaussian solved for (up to six), using alternate parameters.

Comments:

Product Var Name i_nPeaks1

Is element of: GLA05 record, GLA06 record, GLA14 Record

Short Description: Initial Number of Peaks in received echo (alternate)

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 50

Description: The initial number of peaks of the received echo; determined from the smoothed waveform, using alternative parameters

Comments:

Product Var Name i_LandVar

Is element of: GLA14 Record

Short Description: Standard Deviation of the land Gaussian Fit

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: unitless

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 30000

Description: The Standard deviation of the difference between the functional fit and the received echo using alternative parameters. It is directly taken from GLA05 parameter d_wfFitSDev_1 (alternative).

Comments:

Product Var Name i_ElvuseFlg

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Elevation use flag

Product Data Type: i1b (5)

Total Bytes: 5

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -127

Product Maximum: 127

Description: Flag indicating whether the elevations on this record should be used or not (1 bit set/shot). See the <a href='flags/i_ElvuseFlg.pdf'>PDF file</A> for more information.

Comments:

Product Var Name i_atm_avail

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Atmosphere Availability Flag

Product Data Type: i1b

Total Bytes: 1

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 15

Description: Please see <a href='flags/i_atm_avail.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_spare16

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Spare 16

Product Data Type: i1b (4)

Total Bytes: 4

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: n/a

Product Maximum: n/a

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_cld1_mswf

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Cloud Multiple Scattering Warning Flag

Product Data Type: i1b

Total Bytes: 1

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 15

Description: The multiple scattering warning flag (MSWF) is based on the total column optical depth (aerosol plus cloud) calculated in GLA11 using 532nm. It is intended as a way to quickly obtain information about the potential severity of multiple scattering with regards to the range-to-surface calculated by the altimetry processing software. It will be output on the GLA11 product for use by the altimetry group. The multiple scattering warning flag will have values ranging from 0-14, based on the total column optical depth as detailed in the PDF.

A warning flag value of 15 will signify ?invalid?. An invalid will be encoded if an optical depth in any of the layers in the 1-second column could not be calculated. This usually occurs in a very optically ?thick? cloud which extinguishes the signal. It could also occur if the extinction-to-backscatter ratio assignment is set too high, causing the transmission calculations in the lidar inversion to go out-of-range.Please see <a href='flags/i_cld1_mswf_elv.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_MRC_af

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Medium Resolution Cloud Availability Flag

Product Data Type: i1b

Total Bytes: 1

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 15

Description: Tells how many cloud layers were found at this resolution from the 532 nm channel. Please see <a href='flags/i_MRC_af.pdf'> the PDF flag description in the next section for more details. This parameter is extracted from the i_MRCL_flag on GLA09.

Comments:

Product Var Name i_spare9

Is element of: GLA06 record, GLA12 Record, GLA14 Record

Short Description: Spare 9

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: null

Invalid Value/Flag: N/A

Is Correction Flag?: NA

Is Unsigned?: NA

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_ElvFlg

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Elevation Definition Flag

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 127

Description: Indicates how location on the received echo was determined to calculate the elevation on the record.

Please see <a href='flags/i_ElvFlg.pdf'> the PDF flag description in the next section for more details. 'For GLA05, 06 and 12,13,14 and 15, bits are set to reflect the range offset used for that products elevation. Although defined as a pass-thru, the values are different on GLA06/12,13,15 and GLA14.'

Comments:

Product Var Name i_rng_UQF

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Range Offset Quality/Use Flag

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: Data quality flag for the range offsets on this record.

Please see <a href='flags/i_rng_UQF.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_spare49

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Spare 49

Product Data Type: i1b (10)

Total Bytes: 10

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_timecorflg

Is element of: GLA01 Main Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: time correction flag

Product Data Type: i2b

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: Indicates what instrument or bias corrections were applied to the times on this record. Please see <a href='flags/i_timecorflg.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_APID_AvFlg

Is element of: GLA01 Main Record, GLA02 Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: APID Data Availability Flag

Product Data Type: i1b (8)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -127

Product Maximum: 127

Description: Flag indicating which packets (APIDs) for each second are available missing, or filled. APID 19 is broken down further into Altimeter Digitizer, Photon Counter, Cloud Digitizer, GPS/DEM, and C&T sections.

Please see the PDF flag description in the next section for more details.

Comments:

Product Var Name i_AttFlg2

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Attitude Flag 2

Product Data Type: i1b (20)

Total Bytes: 20

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 15

Description: Denotes at 40/sec rate whether precision attitude was used to determine spot location, and if problems with LPA, etc.

Please see <a href='flags/i_AttFlg2.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_spare5

Is element of: GLA14 Record

Short Description: Spare 5

Product Data Type: i1b

Total Bytes: 1

Product Units: NA

Invalid Value/Flag: N/A

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_FrameQF

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Altimeter Frame Quality Flag

Product Data Type: i1b

Total Bytes: 1

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1

Description: Denotes all bad data (no signal in whole frame), or all data good and all science team recommended corrections applied

Please see <a href='flags/i_FrameQF.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_OrbFlg

Is element of: GLA01 Main Record, GLA02 Record, GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: POD flag (Orbit Flag)

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 128

Description: Denotes quality of orbit, whether predicted or precision, loss of GPS data, maneuver-degraded, etc.

Please see <a href='flags/i_OrbFlg.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_rngCorrFlg

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Range Correction Flag

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: Denotes which geophysical or instrument corrections have been applied to the range in the calculation of the elevation on this record.

Please see <a href='flags/i_rngCorrFlg.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_CorrStatFlg

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Correction Status Flag

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: For each geophysical correction that has multiple values denotes which algorithm or model was used.

Please see <a href='flags/i_CorrStatFlg.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_spare15

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Spare 15

Product Data Type: i1b (8)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: n/a

Product Maximum: n/a

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_AttFlg1

Is element of: GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Attitude Flag 1

Product Data Type: i2b

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: At 1/sec denotes large off-nadir angle, ocn sweep, target of opportunity, steering to reference track.

Please see <a href='flags/i_AttFlg1.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_Spare6

Is element of: GLA14 Record

Short Description: Spare 6

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: GLA14 spare6.

Product Var Name i_spare44

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record

Short Description: Spare 44

Product Data Type: i1b (120)

Total Bytes: 120

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: n/a

Product Maximum: n/a

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_satNdx

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Saturation Index

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: ns

Invalid Value/Flag: gi_invalid_i1b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 126

Description: The count of the number of gates in a waveform which have an amplitude greater than or equal to i_satNdxTh (set in anc07_0004). The value 126 means 126 or more gates are above the saturation index threshold (i_satNdxth).

Comments:

Product Var Name i_satElevCorr

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Saturation Elevation Correction

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: mm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 3000

Description: Correction to elevation for saturated waveforms. This correction has not been applied to the data so to apply it SUBTRACT the correction from the range estimate. To apply the correction to the elevations it must be ADDED to the elevation estimates.

Comments:

Product Var Name i_satCorrFlg

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Saturation Correction Flag

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: Yes

Is Unsigned?: NA

Product Minimum: NA

Product Maximum: NA

Description: Please see <a href='flags/i_satCorrFlg.pdf'> the PDF flag description in the next section for more details.

Bits 0-3: i_satElevCorr flag (4 bits); values indicated below:

0= Not Saturated (i_satNdx < 2) or No Signal

1= Sat. Correction is Inconsequential (i_satNdx >= 2 & i_pctSat < 2.0)

2= Sat. Correction is Applicable (i_satNdx >= 2 & i_pctSat >= 2.0 & Full Width* < 100ns)

3= Sat. Correction is Not Computable effects elevations can not be corrected

4= Sat. Correction model is Not Applicable so data can not be corrected (i_satNdx >= 2 & i_pctSat >= 2.0 & Full Width* >= 100ns) there are errors in the data but the effects on elevations can not be corrected

values 5-15=TBD

Bits 4-5: i_satNrgCorr flag (2 bits):

0=TBD

1=TBD

2=TBD

3=TBD

Bits 6-7: TBD:

0=TBD

1=TBD

2=TBD

3=TBD

Comments:

Product Var Name i_satNrgCorr

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Saturation Energy Correction

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: .01fJ

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 100

Description: Correction to energy for saturated waveforms. This correction has not been applied to the energy. It should be ADDED to any echo pulse energy calculated from the pulse area under the waveform. Also any reflectivity estimates need to be corrected for this error in energy measurement.

Comments:

Product Var Name i_spare13

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record

Short Description: Spare 13

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: null

Invalid Value/Flag: null

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_gval_rcv

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Gain Value used for Received Pulse

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: counts

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 255

Description: Gain value used for received pulse - uncalibrated.

Comments: This value is in counts and needs to be calibrated before calculating energy from it. Same as variable in GLA01_Long/i_gainSet1064.

Product Var Name i_RecNrgAll

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Received Energy signal begin to signal end

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: 0.01 fJoules

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32000

Description: This is a pass through of gla01%d_recNrgAll_EU, but stored in different units on the product. This is calculated by taking the area under the received waveform (referenced to the observed noise) from all responses between the noise crossing before the first threshold crossing and the noise crossing after the last threshold crossing. It is a rescaled value of GLA01 parameter d_recNrgAll_EU and is not recomputed.

Comments:

Product Var Name i_FRir_cldtop

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Full Resolution 1064 Cloud Top

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: deka-meters

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1030

Description: Full resolution (40 Hz) cloud top height obtained from the 1064 atmospheric channel. This parameter is for a 1 second record. This parameter is in GLA09.

Comments:

Product Var Name i_FRir_qaFlag

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Full Resolution 1064 Quality Flag

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 15

Description: One byte per data quality flag.

Value 15 = No clouds.

Value 14 = Indicates the likely presence of low clouds (< 150 m) based on elevated signal from the two bins above the ground return bin that were not detected directly by the cloud search algorithm. When this occurs, the 40 Hz cloud top height (i_Frir_cldtop) is set to a value of 0.10 km.

Value 13 = Indicates the possible presence of a cloud based on the value of the integrated signal parameter (i_FRir_intsig) that was not detected directly by the cloud search algorithm. When this occurs, the 40 Hz cloud top height (i_Frir_cldtop) is set to a value of 10.0 km.

Value 0 - 12 = Cloud detected by cloud search algorithm with higher numbers indicating a stronger average signal from the region starting at cloud top and extending 500 m below cloud top height. Please see <a href='flags/i_FRir_qaFlag.pdf'> the PDF flag description in the next section for more details. This parameter is extracted from the equivalent parameter on GLA09.

Comments:

Product Var Name i_atm_char_flag

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Atmosphere Characterization Flag

Product Data Type: i2b

Total Bytes: 2

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 10

Description: Flag to characterize cloud and blowing snow state of the atmosphere

0 clear

1 high cloud (> 5 km) low optical depth

2 high cloud (> 5 km), high optical depth

3 mid cloud (>2, <=5 km) low optical depth

4 mid cloud (>2, <=5 km) high optical depth

5 low cloud (> 500 m, <=2 km), low optical depth

6 low cloud (> 500 m, <=2 km), high optical depth

7 blowing snow or fog (< 500 m), low optical depth

8 blowing snow or fog (< 500 m), high optical depth

9 not tested

10 data quality insufficient to assign flag

Comments:

Product Var Name i_atm_char_conf

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Atmosphere Characterization Flag Confidence

Product Data Type: i2b

Total Bytes: 2

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 3

Description: Confidence level ascribed to the atmosphere characterization flag

Comments: 0 Not applicable (for contamination flag values of 9 or 10)

1 low confidence

2 reasonable confidence

3 high confidence

Product Var Name i_spare48

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Spare 48

Product Data Type: i1b (36)

Total Bytes: 36

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: n/a

Product Maximum: n/a

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_FRir_intsig

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Full Resolution 1064 Integrated Signal

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: e7/(m-sr)

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 10000

Description: Though called 'integrated signal' this is actually an average of all bins in the above-ground portion of the 1064 40 Hz profile with values above the threshold of 1.0e-7 (1/(m-sr) units). This parameter is for a 1 second record. This parameter is extracted from the equivalent parameter on GLA09.

Comments:

Product Var Name i_spare14

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Spare 14

Product Data Type: i1b (120)

Total Bytes: 120

Product Units: Unknown

Invalid Value/Flag: gi_invalid_i1b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_Surface_temp

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Surface Temperature

Product Data Type: i2b

Total Bytes: 2

Product Units: degrees Celsius * 100

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -10000

Product Maximum: 10000

Description: Atmospheric temperature at Earth's surface level measured in degrees Celsius and derived from the meteorological data files.

Comments:

Product Var Name i_Surface_pres

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Surface Pressure

Product Data Type: i2b

Total Bytes: 2

Product Units: hPa * 10

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 20000

Description: Atmospheric pressure at Earth's surface level measured in hPa and derived from the meteorological data files.

Comments:

Product Var Name i_Surface_relh

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Relative Humidity

Product Data Type: i2b

Total Bytes: 2

Product Units: percentage * 100

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 10000

Description: Atmospheric relative humidity at Earth's surface level measured as a percentage and derived from the meteorological data files.

Comments:

Product Var Name i_maxRecAmp

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Max Amplitude of Received Echo

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: Tenth of millivolts

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -300

Product Maximum: 30000

Description: Maximum Amplitude of the Received Echo.

Comments: This is calculated after converting the return to voltage. Use for scaling model fit RMS between normalized and un-normalized units.

Product Var Name i_sDevNsOb1

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Standard deviation of 1064 nm Background noise, (alternate)

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: 0.0001 volts

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 30000

Description: The standard deviation of the background noise (alternative parameters).

Comments: Can be used for computing signal-to-noise ratio along with unsmoothed max amplitude.

Product Var Name i_spare8

Is element of: GLA14 Record

Short Description: i_Spare8

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_isRngOff

Is element of: GLA06 record, GLA12 Record, GLA14 Record

Short Description: Ice Sheet Range Offset

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -150000

Product Maximum: 0

Description: Range offset to be added to i_refRng to calculate the range using the algorithm deemed appropriate for ice sheets.

Comments: Can be used for comparing elevations computed from results standard and alternate fitting.

Product Var Name i_pctSAT

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Percent Saturation

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: percent

Invalid Value/Flag: gi_invalid_i1b

Is Correction Flag?: Yes

Is Unsigned?: NA

Product Minimum: -127

Product Maximum: 127

Description: Percent saturation (d_pctSAT) is calculated using the formula: d_pctSAT= 100*(saturation index)/(signal end - signal begin in nanoseconds). The alternate signal end/begin are used for GLA14%d_pctSAT, while the standard fit values are used for GLA06, 12, 13, and 15. The Saturation elevation correction is not applied in the geolocation processing computation of lat, lon and elev. Because the saturation corrections are small and data is acquired within 5 deg off nadir, effects on lat and lon can be ignored. To apply the saturation elevation correction to the elevations on the products it must be ADDED to the elevation estimates. Reported elevations for returns with invalid satElevCorr values and satCorrFlg values of 3 or 4 are likely to have large, uncorrectable errors and should be excluded from analyses.

Comments:

Product Var Name i_TxNrg

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: 1064 nm Laser Transmit Energy

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: 0.01 millijoules

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32766

Description: The 1064 nm laser pulse transmitted energy in energy units, computed from the digitized outgoing pulse, and the transmit gain.

Comments:

Product Var Name i_eqElv

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Equilibrium Tide Elevation (at first & last shot)

Product Data Type: i2b (2)

Total Bytes: 4

Product Units: mm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: NA

Product Minimum: -10000

Product Maximum: 10000

Description: The equilibrium (long period) tide at first and last valid shot over the ocean.

Comments:

Product Var Name i_Spare7

Is element of: GLA14 Record

Short Description: Spare 7

Product Data Type: i1b (120)

Total Bytes: 120

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: GLA14 spare7.

Product Var Name i_rec_ndx

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: GLAS Record Index

Product Data Type: i4b

Total Bytes: 4

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: Unique index that relates this record to the corresponding record(s) in each GLAS data product.

Comments:

Product Var Name i_UTCTime

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Transmit Time of First Shot in frame in J2000

Product Data Type: i4b (2)

Total Bytes: 8

Product Units: seconds, microseconds

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: The transmit time of the first shot in the 1 second frame measured as 'UTC seconds' elapsed since Jan 1 2000 12:00:00 UTC. This time has been derived from the GPS time accounting for leap seconds. The first item is the whole number of seconds; the second item is the fractional part in microseconds.

Comments: This is not the ground bounce time, but the transmit time.

Product Var Name i_transtime

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: One way transit time

Product Data Type: i2b

Total Bytes: 2

Product Units: microseconds

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 4000

Description: One way transit time calculated using the preliminary range offset. This is added to the UTC time tag to get the ground bounce times at which to calculate the orbit

Comments:

Product Var Name i_Spare1

Is element of: GLA15 Record

Short Description: Spare 1

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: GLA15 spare1.

Product Var Name i_deltagpstmcor

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Delta GPS time correction

Product Data Type: i4b

Total Bytes: 4

Product Units: nanoseconds

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -1000000

Product Maximum: 1000000

Description: The high frequency delta GPS time correction calculated during the precision orbit processing step.

Comments:

Product Var Name i_dShotTime

Is element of: GLA01 Main Record, GLA04 LPA Main Record, GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Laser Shot Time Deltas (shots 2-40)

Product Data Type: i4b (39)

Total Bytes: 156

Product Units: microseconds

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1200000

Description: The time deltas of pulses 2 through 40 to i_UTCTime, the UTC time tag of the first pulse in the 1-second data frame. Adding the deltas to i_UTCTime will give the user the time of each individual shot in the frame.

Comments: To calculate the time for shots 2-40, add these deltas to the time of the first shot.

Product Var Name i_lat

Is element of: GLA15 Record

Short Description: Coordinate Data, Latitude, specific to ocean range

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: microdeg

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -90000000

Product Maximum: 90000000

Description: The geodetic latitude of the forty laser spots in the 1 second time frame, computed from the Precision orbit determined GLAS laser antenna ground nadir coordinates, precision attitude, and ocean-specific range after all instrument corrections, atmospheric delays and tides have been applied. The values are in degrees North.

Comments:

Product Var Name i_lon

Is element of: GLA15 Record

Short Description: Coordinate Data, Longitude, specific to ocean range

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: microdeg

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 360000000

Description: The longitude of the forty laser spots in the 1 second time frame, computed from the Precision orbit determined GLAS laser antenna ground nadir coordinates, precision attitude, and ocean-specific range after all instrument corrections, atmospheric delays and tides have been applied. The values are in east longitude.

Comments:

Product Var Name i_elev

Is element of: GLA15 Record

Short Description: Ocean Surface Elevation

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -500000

Product Maximum: 10000000

Description: Surface elevation with respect to the ellipsoid at the spot location determined by range using the fitting algorithm after instrument corrections, atmospheric delays and tides have been applied.

Comments:

Product Var Name i_campaign

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Campaign

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: INT(ICHAR(1A))

Product Maximum: INT(ICHAR(3K))

Description: The campaign. ie: for campaign L1A, it will be '1A'.

Comments:

Product Var Name i_spare40

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Spare 40

Product Data Type: i2b

Total Bytes: 2

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: n/a

Product Maximum: n/a

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: Spare 40.

Product Var Name i_cycTrk

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Cycle and Track

Product Data Type: i4b

Total Bytes: 4

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 10001

Product Maximum: 9991354

Description: The track and cycle. On the product, they will be stored as one number: ccctttt.

Comments:

Product Var Name i_localSolarTime

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Local apparent solar time

Product Data Type: i4b

Total Bytes: 4

Product Units: seconds*1000

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 86400000

Description: Local apparent solar time.

Comments:

Product Var Name i_spare41

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Spare 41

Product Data Type: i4b (7)

Total Bytes: 28

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: n/a

Product Maximum: n/a

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: Spare 41.

Product Var Name i_deltaEllip

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Delta Ellipsoid

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: mm

Invalid Value/Flag: n/a

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -9000

Product Maximum: 9000

Description: Surface Elevation (T/P ellipsoid) minus Surface Elevation(WGS84 ellipsoid).

Comments:

Product Var Name i_beamCoelv

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Co-elevation

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: degrees*100

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 36000

Description: Co-elevation (CE) is direction from vertical of the laser beam as seen by an observer located at the laser ground spot. 40Hz.

Comments:

Product Var Name i_beamAzimuth

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Azimuth

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: degrees*100

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 36000

Description: The direction, eastwards from north, of the laser beam vector as seen by an observer at the laser ground spot viewing toward the spacecraft (i.e., the vector from the ground to the spacecraft). When the spacecraft is precisely at the geodetic zenith, the value will be 99999 degrees. 40 Hz.

Comments:

Product Var Name i_d2refTrk

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Distance to the reference ground track

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: m*1000

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1000000000

Description: Distance to the reference ground track.

Comments:

Product Var Name i_SigBegOff

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA15 Record

Short Description: Signal Begin Range Offset

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -150000

Product Maximum: 0

Description: Offset to be added to i_refRng to give the range in distance to the location on the received echo calculated as the beginning of signal (closest to the spacecraft) using standard parameters.

Comments:

Product Var Name i_spare45

Is element of: GLA15 Record

Short Description: Spare 45

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: n/a

Product Maximum: n/a

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_spare46

Is element of: GLA15 Record

Short Description: Spare 46

Product Data Type: i2b (9, 40)

Total Bytes: 720

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: n/a

Product Maximum: n/a

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_ElevBiasCorr

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Elevation Bias Correction

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: mm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: NA

Product Minimum: 0

Product Maximum: 3000

Description: Correction to elevation based on post flight analysis for biases determined for each campaign. This bias correction has not been applied to the data so to apply it SUBTRACT the correction from the range estimate. To apply the correction to the elevations it must be ADDED to the elevation estimates.

Comments: See the altimeter user guide for full description.

Product Var Name i_spare42

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Spare 42

Product Data Type: i2b (4, 40)

Total Bytes: 320

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: n/a

Product Maximum: n/a

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: Spare 42

Product Var Name i_sigmaatt

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Attitude Quality Indicator

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: Unitless

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 6000

Description: Attitude quality indicator. Values: 0=good; 50=warning; 100=bad.

Comments: This indicator currently has only 3 values: 0, 50, and 100, leaving open the opportunity to use numbers in between for further resolution of the degradation as our knowledge improves.

Product Var Name i_Azimuth

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Local Azimuth

Product Data Type: i4b

Total Bytes: 4

Product Units: millideg

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 360000

Description: Mean azimuth measured clockwise from north based on latitude, longitude, and elevation of a 1 second interval of the trace of the ground footprint-center.

Comments:

Product Var Name i_SolAng

Is element of: GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Solar Angle

Product Data Type: i4b

Total Bytes: 4

Product Units: microdeg

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -90000000

Product Maximum: 90000000

Description: Solar Angle above or below the plane tangent to the ellipsoid surface at the laser spot. Positive values mean the sun is above the horizon, while negative values mean it is below the horizon. The effect of atmospheric refraction is not included. This is a low-precision value, with approximately one degree accuracy.

Comments:

Product Var Name i_tpintensity_avg

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Transmit Pulse intensity - frame avg

Product Data Type: i4b

Total Bytes: 4

Product Units: counts

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 25500

Description: Transmit pulse intensity as measured by the LPA. Average over the 1-second frame. From ANC09.

Comments:

Product Var Name i_tpazimuth_avg

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Transmit Pulse azimuth - frame avg

Product Data Type: i2b

Total Bytes: 2

Product Units: degrees*10

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 3600

Description: Transmit pulse azimuth. Average over the 1-second frame. Angle eastwards from north of the major axis of the transmit pulse, as seen by the LPA. From ANC09.

Comments:

Product Var Name i_tpeccentricity_avg

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Transmit Pulse eccentricity - frame avg

Product Data Type: i2b

Total Bytes: 2

Product Units: Unitless*1000

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1000

Description: Transmit pulse eccentricity as measured by the LPA. Average over the 1-second frame. From ANC09.

Comments:

Product Var Name i_tpmajoraxis_avg

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Transmit Pulse major axis - frame avg

Product Data Type: i2b

Total Bytes: 2

Product Units: cm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 10000

Description: Transmit pulse major axis as measured by the LPA. Average over the 1-second time frame. From ANC09.

Comments:

Product Var Name i_poTide

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Pole Tide

Product Data Type: i2b

Total Bytes: 2

Product Units: mm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -10000

Product Maximum: 10000

Description: Pole tide: an ocean tide which is the result of the Chandler
wobble (a free nutation of the Earth caused by fluctuating
pressure on the bottom of the ocean, caused by temperature
and salinity changes and wind-driven changes in the circulation
of the oceans).
Comments:

Product Var Name i_gdHt
Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: Geoid
Product Data Type: i2b (2)
Total Bytes: 4
Product Units: cm
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -20000
Product Maximum: 20000
Description: The height of the geoid above the ellipsoid for the first and last shot in the record.
Comments:

Product Var Name i_erElv
Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: Solid Earth Tide Elevation (at first & last shot)
Product Data Type: i2b (2)
Total Bytes: 4
Product Units: mm
Invalid Value/Flag: gi_invalid_i2b
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -10000
Product Maximum: 10000
Description: The solid earth tide elevation for the first & last shot in the record.
Comments:

Product Var Name i_spElv
Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: Tide Elevations, Specific
Product Data Type: i2b (4)
Total Bytes: 8

Product Units: mm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -10000

Product Maximum: 10000

Description: A tide elevation calculated from alternate tide models for specific regions for shots 1, 11, 21, and 31.

Comments:

Product Var Name i_ldElv

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Load Tide Elevation

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: mm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -10000

Product Maximum: 10000

Description: The load tide elevation applied to each shot. Elements 1-4 of the load tide vector are applied to shots 1-10, 11-20, 21-30, and 31-40, respectively.

Comments: The load tide is NOT NECESSARILY the load tide for shots 1,11,21,31. It is calculated for the first valid shot in each group of 10 and applied to all valid shots in the group.

Product Var Name i_bathyElv

Is element of: GLA15 Record

Short Description: Bathymetry Elevation

Product Data Type: i4b

Total Bytes: 4

Product Units: cm

Invalid Value/Flag: n/a

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -500000

Product Maximum: 1000000

Description: Bathymetry Elevation

Comments:

Product Var Name i_wTrop

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Range Correction_Wet Troposphere

Product Data Type: i2b (2)

Total Bytes: 4

Product Units: mm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -1000

Product Maximum: 0

Description: The range correction due to the wet troposphere at first & last shot.

Comments:

Product Var Name i_dTrop

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA15 Record

Short Description: Range Correction, Dry Troposphere

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: mm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -2500

Product Maximum: 0

Description: The range correction due to the dry troposphere; one correction for each shot.Validity is based on results of finding a range with the standard fit.

Comments:

Product Var Name i_surfType

Is element of: GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Region Type

Product Data Type: i1b

Total Bytes: 1

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 1

Product Maximum: 15

Description: Describes the region type or types associated with each shot Ice Sheet, ocean, sea ice, or Land.

Please see <a href='flags/i_surfType.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_Spare3

Is element of: GLA15 Record

Short Description: Spare 3

Product Data Type: i1b (3)

Total Bytes: 3

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: GLA15 spare3.

Product Var Name i_MSS_elv

Is element of: GLA15 Record

Short Description: Mean Sea Surface Elevation

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: cm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -50000

Product Maximum: 1000000

Description: The mean sea surface elevation from GSFC's data file DNSC08MSS_1min.mss.gz This is in reference to the TOPEX/Poseidon ellipsoid.

Comments:

Product Var Name i_refRng

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Reference Range

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 400000000

Product Maximum: 1000000000

Description: Range in distance calculated from the time between the centroid of the transmit pulse and the farthest gate from the spacecraft of the received pulse. See the rngcorrflg to determine any corrections that have been applied.

Comments:

Product Var Name i_TrshRngOff

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA15 Record

Short Description: Threshold Retracker Range Offset

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -150000

Product Maximum: 0

Description: Offset to be added to i_refRng to give the range in distance to the threshold retracker location on the received echo using standard parameters.

Comments:

Product Var Name i_ocRngOff

Is element of: GLA06 record, GLA15 Record

Short Description: Ocean Range Offset

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -150000

Product Maximum: 0

Description: Range offset to be added to i_refRng to calculate the range using the algorithm deemed appropriate for oceans.

Comments:

Product Var Name i_SigEndOff

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA15 Record

Short Description: Signal End Range Offset

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -150000

Product Maximum: 0

Description: Offset to be added to i_refRng to give the range in distance to the location on the received echo calculated as the end of signal (farthest from the spacecraft) using standard parameters.

Comments:

Product Var Name i_cntRngOff

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA15 Record

Short Description: Centroid Range Offset

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -150000

Product Maximum: 0

Description: Offset to be added to i_refRng to give the range in distance to the location of the centroid of the received echo from signal begin through signal end defined by the standard parameters.

Comments:

Product Var Name i_reflctUC

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: reflctUC

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: Unitless*1E06

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1000000

Description: Reflectivity, not corrected for atmospheric effects, is calculated as Refl = R/T, where R is the received energy after it has been scaled for range, and T is the transmitted energy. i_reflctUC has also been calibrated for gain non-linearity (only for non-saturated waveforms), ground truth calibration and boresight shift shadowing (BSS). It is not corrected for saturation effects. If the shot is saturated (satindex above 2) then to correct for saturation the reflectivity estimate needs to be multiplied by the ratio of the corrected energy to the uncorrected energy (sat corrected reflectivity = i_reflctUC * (i_RecNrgAll + i_satNrgCorr)/i_RecNrgAll)

The atmospheric corrected reflectivity may be calculated from this uncorrected reflectivity by multiplying it by d_reflCor_atm.

i_reflctUC is invalid where GLA06%d_satNrgCorr is invalid.

Comments: This uses all signal between signal begin and signal end.

Product Var Name i_reflCor_atm

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Reflectivity Correction Factor For Atmospheric Effects

Product Data Type: i4b

Total Bytes: 4

Product Units: Unitless

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 1

Product Maximum: 250

Description: This reflectance correction factor is calculated as 1 / e^(-2(tc+ta+tp+tm)), where tc is the cloud (column) integrated optical depth, ta is the aerosol (column) integrated optical depth, tp is the planetary boundary layer optical depth, and tm is the molecular optical depth. tm is a constant equal to -log(gd_T_RTatm)/2, where gd_T_RTatm = 0.98 is defined in const_elev_mod.f90 or read from ANC07-03. The attenuation correction factor has been corrected for multiple scattering. The reflectance has been corrected for waveform saturation.

Comments:

Product Var Name i_maxSmAmp

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Peak Amplitude of Smoothed Received Echo

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: Tenth of millivolts

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -300

Product Maximum: 30000

Description: The peak amplitude of the received echo after it has been smoothed to remove high frequency noise (see ATBD).

Comments: This is calculated after converting the return to voltage.

Product Var Name i_ocElv

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Ocean Tide Elevation

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: mm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -10000

Product Maximum: 10000

Description: The ocean tide elevation from the TPX07.1 tide model.

Comments:

Product Var Name i_numPk

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA15 Record

Short Description: Number of Peaks found in the Return

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 6

Description: The number of peaks in the return echo found by the Gaussian fitting procedure, using standard parameters.

Comments:

Product Var Name i_skew2

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA15 Record

Short Description: Skewness

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: unitless * 100

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -10000

Product Maximum: 10000

Description: The skewness of the received echo from signal begin to signal end using standard parameters.

Comments: Note that the received echo was calibrated and converted to voltage before calculation.

Product Var Name i_OcRufRMS

Is element of: GLA15 Record

Short Description: RMS of elevations used for 1-sec mean elevation

Product Data Type: i4b

Total Bytes: 4

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 120000

Description: The standard deviation of the up to 40 GLA15 ocean elevations measurements.Comments:

Product Var Name i_OcMeanElev

Is element of: GLA15 Record

Short Description: Mean elevation over 1 sec

Product Data Type: i4b

Total Bytes: 4

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -500000

Product Maximum: 10000000

Description: 1 -sec mean elevation of the up to 40 GLA15 ocean elevations.

Comments:

Product Var Name i_lowElev

Is element of: GLA15 Record

Short Description: Lowest Elevation

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -500000

Product Maximum: 10000000

Description: Lowest elevation in footprint, with all corrections applied (corresponds to signal end) using standard parameters.

Comments:

Product Var Name i_highElev

Is element of: GLA15 Record

Short Description: Highest Elevation

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: mm

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -500000

Product Maximum: 10000000

Description: Highest elevation in footprint, with all corrections applied (corresponds to signal begin) using standard parameters.

Comments:

Product Var Name i_OceanVar

Is element of: GLA15 Record

Short Description: Standard Deviation of the ocean Gaussian Fit

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: microvolts*10

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 30000

Description: The Standard deviation of the difference between the functional fit and the received echo using standard parameters. It is directly taken from GLA05 parameter d_wfFitSDev_2 (standard).

Comments:

Product Var Name i_ElvuseFlg

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Elevation use flag

Product Data Type: i1b (5)

Total Bytes: 5

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -127

Product Maximum: 127

Description: Flag indicating whether the elevations on this record should be used or not (1 bit set/shot). See the <a href='flags/i_ElvuseFlg.pdf'>PDF file</A> for more information.

Comments:

Product Var Name i_atm_avail

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Atmosphere Availability Flag

Product Data Type: i1b

Total Bytes: 1

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 15

Description: Please see <a href='flags/i_atm_avail.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_spare16

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Spare 16

Product Data Type: i1b (4)

Total Bytes: 4

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: n/a

Product Maximum: n/a

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_cld1_mswf

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Cloud Multiple Scattering Warning Flag

Product Data Type: i1b

Total Bytes: 1

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 15

Description: The multiple scattering warning flag (MSWF) is based on the total column optical depth (aerosol plus cloud) calculated in GLA11 using 532nm. It is intended as a way to quickly obtain information about the potential severity of multiple scattering with regards to the range-to-surface calculated by the altimetry processing software. It will be output on the GLA11 product for use by the altimetry group. The multiple scattering warning flag will have values ranging from 0-14, based on the total column optical depth as detailed in the PDF.

A warning flag value of 15 will signify ?invalid?. An invalid will be encoded if an optical depth in any of the layers in the 1-second column could not be calculated. This usually occurs in a very optically ?thick? cloud which extinguishes the signal. It could also occur if the extinction-to-backscatter ratio assignment is set too high, causing the transmission calculations in the lidar inversion to go out-of-range.Please see <a href='flags/i_cld1_mswf_elv.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_MRC_af

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Medium Resolution Cloud Availability Flag

Product Data Type: i1b

Total Bytes: 1

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 15

Description: Tells how many cloud layers were found at this resolution from the 532 nm channel. Please see <a href='flags/i_MRC_af.pdf'> the PDF flag description in the next section for more details. This parameter is extracted from the i_MRCL_flag on GLA09.

Comments:

Product Var Name i_spare9

Is element of: GLA15 Record

Short Description: spares

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: null

Invalid Value/Flag: No

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_ElvFlg

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Elevation Definition Flag

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 127

Description: Indicates how location on the received echo was determined to calculate the elevation on the record.

Please see <a href='flags/i_ElvFlg.pdf'> the PDF flag description in the next section for more details. 'For GLA05, 06 and 12,13,14 and 15, bits are set to reflect the range offset used for that products elevation. Although defined as a pass-thru, the values are different on GLA06/12,13,15 and GLA14.'

Comments:

Product Var Name i_rng_UQF

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Range Offset Quality/Use Flag

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: Data quality flag for the range offsets on this record.

Please see <a href='flags/i_rng_UQF.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_spare49

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Spare 49

Product Data Type: i1b (10)

Total Bytes: 10

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_timecorflg

Is element of: GLA01 Main Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: time correction flag

Product Data Type: i2b

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: Indicates what instrument or bias corrections were applied to the times on this record. Please see <a href='flags/i_timecorflg.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_APID_AvFlg

Is element of: GLA01 Main Record, GLA02 Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: APID Data Availability Flag

Product Data Type: i1b (8)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -127

Product Maximum: 127

Description: Flag indicating which packets (APIDs) for each second are available missing, or filled. APID 19 is broken down further into Altimeter Digitizer, Photon Counter, Cloud Digitizer, GPS/DEM, and C&T sections.

Please see the PDF flag description in the next section for more details.

Comments:

Product Var Name i_AttFlg2

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Attitude Flag 2

Product Data Type: i1b (20)

Total Bytes: 20

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 15

Description: Denotes at 40/sec rate whether precision attitude was used to determine spot location, and if problems with LPA, etc.

Please see <a href='flags/i_AttFlg2.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_spare5

Is element of: GLA15 Record

Short Description: Spare 5

Product Data Type: i1b

Total Bytes: 1

Product Units: NA

Invalid Value/Flag: N/A

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_FrameQF

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Altimeter Frame Quality Flag

Product Data Type: i1b

Total Bytes: 1

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1

Description: Denotes all bad data (no signal in whole frame), or all data good and all science team recommended corrections applied

Please see <a href='flags/i_FrameQF.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_OrbFlg

Is element of: GLA01 Main Record, GLA02 Record, GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: POD flag (Orbit Flag)

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 128

Description: Denotes quality of orbit, whether predicted or precision, loss of GPS data, maneuver-degraded, etc.

Please see <a href='flags/i_OrbFlg.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_rngCorrFlg

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Range Correction Flag

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: Denotes which geophysical or instrument corrections have been applied to the range in the calculation of the elevation on this record.

Please see <a href='flags/i_rngCorrFlg.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_CorrStatFlg

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Correction Status Flag

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: For each geophysical correction that has multiple values denotes which algorithm or model was used.

Please see <a href='flags/i_CorrStatFlg.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_spare15

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Spare 15

Product Data Type: i1b (8)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: n/a

Product Maximum: n/a

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_AttFlg1

Is element of: GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Attitude Flag 1

Product Data Type: i2b

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: At 1/sec denotes large off-nadir angle, ocn sweep, target of opportunity, steering to reference track.

Please see <a href='flags/i_AttFlg1.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_Spare6

Is element of: GLA15 Record

Short Description: Spare 6

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: GLA15 spare6.

Product Var Name i_satNdx

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Saturation Index

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: ns

Invalid Value/Flag: gi_invalid_i1b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 126

Description: The count of the number of gates in a waveform which have an amplitude greater than or equal to i_satNdxTh (set in anc07_0004). The value 126 means 126 or more gates are above the saturation index threshold (i_satNdxth).

Comments:

Product Var Name i_satElevCorr

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Saturation Elevation Correction

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: mm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 3000

Description: Correction to elevation for saturated waveforms. This correction has not been applied to the data so to apply it SUBTRACT the correction from the range estimate. To apply the correction to the elevations it must be ADDED to the elevation estimates.

Comments:

Product Var Name i_satCorrFlg

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Saturation Correction Flag

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: Yes

Is Unsigned?: NA

Product Minimum: NA

Product Maximum: NA

Description: Please see <a href='flags/i_satCorrFlg.pdf'> the PDF flag description in the next section for more details.

Bits 0-3: i_satElevCorr flag (4 bits); values indicated below:

0= Not Saturated (i_satNdx < 2) or No Signal

1= Sat. Correction is Inconsequential (i_satNdx >= 2 & i_pctSat < 2.0)

2= Sat. Correction is Applicable (i_satNdx >= 2 & i_pctSat >= 2.0 & Full Width* < 100ns)

3= Sat. Correction is Not Computable effects elevations can not be corrected

4= Sat. Correction model is Not Applicable so data can not be corrected (i_satNdx >= 2 & i_pctSat >= 2.0 & Full Width* >= 100ns) there are errors in the data but the effects on elevations can not be corrected

values 5-15=TBD

Bits 4-5: i_satNrgCorr flag (2 bits):

0=TBD

1=TBD

2=TBD

3=TBD

Bits 6-7: TBD :

0=TBD

1=TBD

2=TBD

3=TBD

Comments:

Product Var Name i_satNrgCorr

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Saturation Energy Correction

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: .01fJ

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 100

Description: Correction to energy for saturated waveforms. This correction has not been applied to the energy. It should be ADDED to any echo pulse energy calculated from the pulse area under the waveform. Also any reflectivity estimates need to be corrected for this error in energy measurement.

Comments:

Product Var Name i_kurt2

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA15 Record

Short Description: Kurtosis of the Received Echo (standard)

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: unitless * 100

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -1000

Product Maximum: 1000

Description: Kurtosis of the received echo from signal begin to signal end using standard parameters

Comments: Note that the received echo was calibrated and converted to voltage before calculation.

Product Var Name i_gval_rcv

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Gain Value used for Received Pulse

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: counts

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 255

Description: Gain value used for received pulse - uncalibrated.

Comments: This value is in counts and needs to be calibrated before calculating energy from it. Same as variable in GLA01_Long/i_gainSet1064.

Product Var Name i_RecNrgAll

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Received Energy signal begin to signal end

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: 0.01 fJoules

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32000

Description: This is a pass through of gla01%d_recNrgAll_EU, but stored in different units on the product. This is calculated by taking the area under the received waveform (referenced to the observed noise) from all responses between the noise crossing before the first threshold crossing and the noise crossing after the last threshold crossing. It is a rescaled value of GLA01 parameter d_recNrgAll_EU and is not recomputed.

Comments:

Product Var Name i_FRir_cldtop

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Full Resolution 1064 Cloud Top

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: deka-meters

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1030

Description: Full resolution (40 Hz) cloud top height obtained from the 1064 atmospheric channel. This parameter is for a 1 second record. This parameter is in GLA09.

Comments:

Product Var Name i_FRir_qaFlag

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Full Resolution 1064 Quality Flag

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 15

Description: One byte per data quality flag.

Value 15 = No clouds.

Value 14 = Indicates the likely presence of low clouds (< 150 m) based on elevated signal from the two bins above the ground return bin that were not detected directly by the cloud search algorithm. When this occurs, the 40 Hz cloud top height (i_Frir_cldtop) is set to a value of 0.10 km.

Value 13 = Indicates the possible presence of a cloud based on the value of the integrated signal parameter (i_FRir_intsig) that was not detected directly by the cloud search algorithm. When this occurs, the 40 Hz cloud top height (i_Frir_cldtop) is set to a value of 10.0 km.

Value 0 - 12 = Cloud detected by cloud search algorithm with higher numbers indicating a stronger average signal from the region starting at cloud top and extending 500 m below cloud top height. Please see <a href='flags/i_FRir_qaFlag.pdf'> the PDF flag description in the next section for more details. This parameter is extracted from the equivalent parameter on GLA09.

Comments:

Product Var Name i_atm_char_flag

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Atmosphere Characterization Flag

Product Data Type: i2b

Total Bytes: 2

Product Units: n/a

Invalid Value/Flag: n/a

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 10

Description: Flag to characterize cloud and blowing snow state of the atmosphere

0 clear

1 high cloud (> 5 km) low optical depth

2 high cloud (> 5 km), high optical depth
3 mid cloud (>2, <=5 km) low optical depth
4 mid cloud (>2, <=5 km) high optical depth
5 low cloud (> 500 m, <=2 km), low optical depth
6 low cloud (> 500 m, <=2 km), high optical depth
7 blowing snow or fog (< 500 m), low optical depth
8 blowing snow or fog (< 500 m), high optical depth
9 not tested
10 data quality insufficient to assign flag
Comments:

Product Var Name i_atm_char_conf
Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: Atmosphere Characterization Flag Confidence
Product Data Type: i2b
Total Bytes: 2
Product Units: n/a
Invalid Value/Flag: n/a
Is Correction Flag?: No
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 3
Description: Confidence level ascribed to the atmosphere characterization flag
Comments: 0 Not applicable (for contamination flag values of 9 or 10)
1 low confidence
2 reasonable confidence
3 high confidence

Product Var Name i_spare48
Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record
Short Description: Spare 48
Product Data Type: i1b (36)
Total Bytes: 36
Product Units: n/a
Invalid Value/Flag: n/a
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: n/a
Product Maximum: n/a

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_FRir_intsig

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Full Resolution 1064 Integrated Signal

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: e7/(m-sr)

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 10000

Description: Though called 'integrated signal' this is actually an average of all bins in the above-ground portion of the 1064 40 Hz profile with values above the threshold of 1.0e-7 (1/(m-sr) units). This parameter is for a 1 second record. This parameter is extracted from the equivalent parameter on GLA09.

Comments:

Product Var Name i_spare14

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Spare 14

Product Data Type: i1b (120)

Total Bytes: 120

Product Units: Unknown

Invalid Value/Flag: gi_invalid_i1b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_Surface_temp

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Surface Temperature

Product Data Type: i2b

Total Bytes: 2

Product Units: degrees Celsius * 100

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -10000

Product Maximum: 10000

Description: Atmospheric temperature at Earth's surface level measured in degrees Celsius and derived from the meteorological data files.

Comments:

Product Var Name i_Surface_pres

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Surface Pressure

Product Data Type: i2b

Total Bytes: 2

Product Units: hPa * 10

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 20000

Description: Atmospheric pressure at Earth's surface level measured in hPa and derived from the meteorological data files.

Comments:

Product Var Name i_Surface_relh

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Relative Humidity

Product Data Type: i2b

Total Bytes: 2

Product Units: percentage * 100

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 10000

Description: Atmospheric relative humidity at Earth's surface level measured as a percentage and derived from the meteorological data files.

Comments:

Product Var Name i_Surface_wind

Is element of: GLA07 Record, GLA15 Record

Short Description: Surface Wind Speed

Product Data Type: i2b

Total Bytes: 2

Product Units: meters/second * 100

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 20000

Description: Wind speed at Earth's surface level measured in km/hour and derived from the meteorological data files.

Comments:

Product Var Name i_Surface_wdir

Is element of: GLA07 Record, GLA15 Record

Short Description: Surface Wind Direction Azimuth from North

Product Data Type: i2b

Total Bytes: 2

Product Units: degrees * 10

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 3600

Description: Wind direction at Earth's surface level measured in degrees of azimuth from North and derived from the meteorological data files.

Comments:

Product Var Name i_maxRecAmp

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Max Amplitude of Received Echo

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: Tenth of millivolts

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -300

Product Maximum: 30000

Description: Maximum Amplitude of the Received Echo.

Comments: This is calculated after converting the return to voltage. Use for scaling model fit RMS between normalized and un-normalized units.

Product Var Name i_sDevNsOb1

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Standard deviation of 1064 nm Background noise, (alternate)

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: 0.0001 volts

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 30000

Description: The standard deviation of the background noise (alternative parameters).

Comments: Can be used for computing signal-to-noise ratio along with unsmoothed max amplitude.

Product Var Name i_spare4

Is element of: GLA06 record, GLA12 Record, GLA14 Record, GLA15 Record

Short Description: Spare 4

Product Data Type: i1b (160)

Total Bytes: 160

Product Units: null

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_pctSAT

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Percent Saturation

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: percent

Invalid Value/Flag: gi_invalid_i1b

Is Correction Flag?: Yes

Is Unsigned?: NA

Product Minimum: -127

Product Maximum: 127

Description: Percent saturation (d_pctSAT) is calculated using the formula: d_pctSAT= 100*(saturation index)/(signal end - signal begin in nanoseconds). The alternate signal end/begin are used for GLA14%d_pctSAT, while the standard fit values are used for GLA06, 12, 13, and 15. The Saturation elevation correction is not applied in the geolocation processing computation of lat, lon and elev. Because the saturation corrections are small and data is acquired within 5 deg off nadir, effects on lat and lon can be ignored. To apply the saturation elevation correction to the elevations on the products it must be ADDED to the elevation estimates. Reported elevations for returns with invalid satElevCorr values and satCorrFlg values of 3 or 4 are likely to have large, uncorrectable errors and should be excluded from analyses.

Comments:

Product Var Name i_TxNrg

Is element of: GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: 1064 nm Laser Transmit Energy

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: 0.01 millijoules

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32766

Description: The 1064 nm laser pulse transmitted energy in energy units, computed from the digitized outgoing pulse, and the transmit gain.

Comments:

Product Var Name i_eqElv

Is element of: GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Equilibrium Tide Elevation (at first & last shot)

Product Data Type: i2b (2)

Total Bytes: 4

Product Units: mm

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: NA

Is Unsigned?: NA

Product Minimum: -10000

Product Maximum: 10000

Description: The equilibrium (long period) tide at first and last valid shot over the ocean.

Comments:

Product Var Name i_spare2

Is element of: GLA15 Record

Short Description: Spare 2

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: GLA15 spare2.

Product Var Name i_gASP

Is element of: GLA15 Record

Short Description: Global Mean Atmospheric Pressure

Product Data Type: i4b

Total Bytes: 4

Product Units: .001 Pa

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 10000000

Product Maximum: 120000000

Description:

Comments:

Product Var Name i_Spare7

Is element of: GLA15 Record

Short Description: Spare 7

Product Data Type: i1b (144)

Total Bytes: 144

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: GLA15 spare7.

Product Var Name i_rec_ndx

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: GLAS Record Index

Product Data Type: i4b

Total Bytes: 4

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: Unique index that relates this record to the corresponding record(s) in each GLAS data product.

Comments:

Product Var Name i_UTCTime

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Transmit Time of First Shot in frame in J2000

Product Data Type: i4b (2)

Total Bytes: 8

Product Units: seconds, microseconds

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: The transmit time of the first shot in the 1 second frame measured as 'UTC seconds' elapsed since Jan 1 2000 12:00:00 UTC. This time has been derived from the GPS time accounting for leap seconds. The first item is the whole

number of seconds; the second item is the fractional part in microseconds.

Comments: This is not the ground bounce time, but the transmit time.

Product Var Name i_phdr_20

Is element of: GLA03 Main Record

Short Description: Primary Header APID 20

Product Data Type: i1b (6, 4)

Total Bytes: 24

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: null
Product Maximum: null
Description: Primary Header APID 20
Comments:

Product Var Name i_shdr_20
Is element of: GLA03 Main Record
Short Description: Secondary Header APID 20 (time stamp)
Product Data Type: i1b (8, 4)
Total Bytes: 32
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: null
Product Maximum: null
Description: Secondary Header APID 20 (time stamp)
Comments:

Product Var Name i_g_nrg
Is element of: GLA03 Main Record
Short Description: 532 Energy Throughput
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: Percent X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 100
Description: 532 Energy
Comments:

Product Var Name i_Lsr1Osc_t
Is element of: GLA03 Main Record
Short Description: Laser Oscillator Temperature
Product Data Type: i2b (4)

Total Bytes: 8
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 3000
Description: Laser Oscillator Temperature
Comments:

Product Var Name i_Lsr1Dblr_t
Is element of: GLA03 Main Record
Short Description: Laser Doubler Temperature
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 3000
Description: Laser Doubler Temperature
Comments:

Product Var Name i_LMB1Ref_t
Is element of: GLA03 Main Record
Short Description: LMB Reference Temperature
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 3000
Description: Laser Monitor Board (LMB) Reference Temperature
Comments:

Product Var Name i_L1Elec_t
Is element of: GLA03 Main Record

Short Description: Electronics Temperature
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 3000
Description: Electronics Temperature (MEU)
Comments:

Product Var Name i_LsrOsc_c
Is element of: GLA03 Main Record
Short Description: Laser Oscillator Current
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: Amps
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 105
Product Maximum: 145
Description: Laser Osc Current
Comments:

Product Var Name i_LsrAmp_c
Is element of: GLA03 Main Record
Short Description: Laser Amplifier Current
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: Amps
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 105
Product Maximum: 145
Description: Laser Amp Current
Comments:

Product Var Name i_LsrDr_pw
Is element of: GLA03 Main Record
Short Description: Laser Drive Pulse Width
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: pw in microsec
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 105
Product Maximum: 145
Description: Laser Dr Pulse Width
Comments:

Product Var Name i_Lsr2Osc_t
Is element of: GLA03 Main Record
Short Description: Oscillator Temperature
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 3000
Description:
Comments:

Product Var Name i_Lsr2Dblr_t
Is element of: GLA03 Main Record
Short Description: Laser Doubler Temperature
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 3000
Description:

Comments:

Product Var Name i_LMB2Ref_t
Is element of: GLA03 Main Record
Short Description: LMB Reference Temperature
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 3000
Description:
Comments:

Product Var Name i_L2Elect_t
Is element of: GLA03 Main Record
Short Description: Electronics Temperature
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 3000
Description:
Comments:

Product Var Name i_Lsr3Osc_t
Is element of: GLA03 Main Record
Short Description: Oscillator Temperature
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0

Product Maximum: 3000
Description:
Comments:

Product Var Name i_Lsr3Dblr_t
Is element of: GLA03 Main Record
Short Description: Laser Doubler Temperature
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 3000
Description:
Comments:

Product Var Name i_LMB3Ref_t
Is element of: GLA03 Main Record
Short Description: LMB Reference Temperature
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 3000
Description:
Comments:

Product Var Name i_L3Elect_t
Is element of: GLA03 Main Record
Short Description: Electronics Temperature
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA

Is Unsigned?: No
Product Minimum: 0
Product Maximum: 3000
Description:
Comments:

Product Var Name i_PrimAD550v
Is element of: GLA03 Main Record
Short Description: Primary Altimeter Detector 550V Voltage
Product Data Type: i4b (4)
Total Bytes: 16
Product Units: Volts X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 53500
Product Maximum: 56500
Description: Primary Altimeter Detector 550 V
Comments:

Product Var Name i_SecAD550v
Is element of: GLA03 Main Record
Short Description: Secondary Altimeter Detector 550V Voltage
Product Data Type: i4b (4)
Total Bytes: 16
Product Units: Volts X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 53500
Product Maximum: 56500
Description: Secondary Altimeter Detector 550 V
Comments:

Product Var Name i_spcm1_550v
Is element of: GLA03 Main Record
Short Description: SPCM Detector #1 550V Voltage
Product Data Type: i4b (4)
Total Bytes: 16
Product Units: Volts X 100

Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 53500
Product Maximum: 56500
Description: SPCM Detector #1 550 V
Comments:

Product Var Name i_spcm2_550v
Is element of: GLA03 Main Record
Short Description: SPCM Detector #2 550V Voltage
Product Data Type: i4b (4)
Total Bytes: 16
Product Units: Volts X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 53500
Product Maximum: 56500
Description: SPCM Detector #2 550 V
Comments:

Product Var Name i_spcm3_550v
Is element of: GLA03 Main Record
Short Description: SPCM Detector #3 550V Voltage
Product Data Type: i4b (4)
Total Bytes: 16
Product Units: Volts X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 53500
Product Maximum: 56500
Description: SPCM Detector #3 550 V
Comments:

Product Var Name i_spcm4_550v
Is element of: GLA03 Main Record
Short Description: SPCM Detector #4 550V Voltage
Product Data Type: i4b (4)

Total Bytes: 16
Product Units: Volts X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 53500
Product Maximum: 56500
Description: SPCM Detector #4 550 V
Comments:

Product Var Name i_spcm5_550v
Is element of: GLA03 Main Record
Short Description: SPCM Detector #5 550V Voltage
Product Data Type: i4b (4)
Total Bytes: 16
Product Units: Volts X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 53500
Product Maximum: 56500
Description: SPCM Detector #5 550 V
Comments:

Product Var Name i_spcm6_550v
Is element of: GLA03 Main Record
Short Description: SPCM Detector #6 550V Voltage
Product Data Type: i4b (4)
Total Bytes: 16
Product Units: Volts X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 53500
Product Maximum: 56500
Description: SPCM Detector #6 550 V
Comments:

Product Var Name i_spcm7_550v
Is element of: GLA03 Main Record

Short Description: SPCM Detector #7 550V Voltage
Product Data Type: i4b (4)
Total Bytes: 16
Product Units: Volts X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 53500
Product Maximum: 56500
Description: SPCM Detector #7 550 V
Comments:

Product Var Name i_spcm8_550v
Is element of: GLA03 Main Record
Short Description: SPCM Detector #8 550V Voltage
Product Data Type: i4b (4)
Total Bytes: 16
Product Units: Volts X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 53500
Product Maximum: 56500
Description: SPCM Detector #8 550 V
Comments:

Product Var Name i_Int1_t
Is element of: GLA03 Main Record
Short Description: Internal Temperature #1
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: Celsius
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 105
Product Maximum: 145
Description: Internal Temp #1
Comments:

Product Var Name i_ct_prail_v
Is element of: GLA03 Main Record
Short Description: C & T Positive Rail
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: Volts X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -10000
Product Maximum: 20000
Description:
Comments:

Product Var Name i_Int3_t
Is element of: GLA03 Main Record
Short Description: Internal Temperature #3
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: Celsius
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 105
Product Maximum: 145
Description: Internal Temp #3
Comments:

Product Var Name i_VCXmtr_c
Is element of: GLA03 Main Record
Short Description: VC X Motor Current
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: milliAmps
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 150
Product Maximum: 200
Description: VC X Motor Current

Comments:

Product Var Name i_VCYmtr_c
Is element of: GLA03 Main Record
Short Description: VC Y Motor Current
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: milliAmps
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 150
Product Maximum: 200
Description: VC Y Motor Current
Comments:

Product Var Name i_Xpos
Is element of: GLA03 Main Record
Short Description: X Position
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: Volts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 3600
Description: X Position
Comments:

Product Var Name i_Ypos
Is element of: GLA03 Main Record
Short Description: Y Position
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: Volts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0

Product Maximum: 3600

Description: Y Position

Comments:

Product Var Name i_ADdetOutGn

Is element of: GLA03 Main Record

Short Description: Transmitted Gain

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 255

Description: The transmitted gain value. The AD Detector Outgoing Gain readback. Commanded value; repeats for 4 seconds. From APID 20, Offset 29.

Comments:

Product Var Name i_ADdetRetGn

Is element of: GLA03 Main Record

Short Description: AD Detector Return Gain readback

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 255

Description: AD Detector Return Gain readback

Comments:

Product Var Name i_DPinA

Is element of: GLA03 Main Record

Short Description: Dual Pin -A Throughput

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: Percent X 100

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No
Product Minimum: 0
Product Maximum: 10000
Description: Dual Pin -A
Comments:

Product Var Name i_DPinB
Is element of: GLA03 Main Record
Short Description: Dual Pin -B Throughput
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: Percent X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 10000
Description: Dual Pin -B
Comments:

Product Var Name i_Laser1_stat
Is element of: GLA03 Main Record
Short Description: Laser 1 Status
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 1
Description: Indicates whether Laser 1 is enabled or disabled. Value of 0 = enabled; 1 = disabled.
Comments:

Product Var Name i_Laser2_stat
Is element of: GLA03 Main Record
Short Description: Laser 2 Status
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 1
Description: Indicates whether Laser 2 is enabled or disabled. Value of 0 = enabled; 1 = disabled.
Comments:

Product Var Name i_Laser3_stat
Is element of: GLA03 Main Record
Short Description: Laser 3 Status
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 1
Description: Indicates whether Laser 3 is enabled or disabled. Value of 0 = enabled; 1 = disabled.
Comments:

Product Var Name i_OTS_stat
Is element of: GLA03 Main Record
Short Description: OTS Enable Status
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 1
Description: Indicates whether OTS is enabled or disabled. Value of 0 = enabled; 1 = disabled.
Comments:

Product Var Name i_phdr_21
Is element of: GLA03 Main Record
Short Description: Primary Header APID 21
Product Data Type: i1b (6, 4)

Total Bytes: 24
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: null
Product Maximum: null
Description: Primary Header APID 21
Comments:

Product Var Name i_shdr_21
Is element of: GLA03 Main Record
Short Description: Secondary Header APID 21 (time stamp)
Product Data Type: i1b (8, 4)
Total Bytes: 32
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: null
Product Maximum: null
Description: Secondary Header APID 21 (time stamp)
Comments:

Product Var Name i_BusAInst_28v
Is element of: GLA03 Main Record
Short Description: +28V Bus A Instrument Voltage
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: Volts X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 2400
Product Maximum: 3200
Description: +28V Bus A Instrument
Comments:

Product Var Name i_HBSupp_c
Is element of: GLA03 Main Record

Short Description: Hybrid Supplies Current
Product Data Type: i4b (4)
Total Bytes: 16
Product Units: Amps X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 1200
Product Maximum: 1500
Description: Hybrid Supplies
Comments:

Product Var Name i_HVPSDetSup_c
Is element of: GLA03 Main Record
Short Description: HVPS Detector Supplies Current
Product Data Type: i4b (4)
Total Bytes: 16
Product Units: Amps X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 2200
Product Maximum: 2800
Description: HVPS Detector Supplies
Comments:

Product Var Name i_OpHtr_c
Is element of: GLA03 Main Record
Short Description: Operational Heaters Current
Product Data Type: i4b (4)
Total Bytes: 16
Product Units: Amps X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 400
Product Maximum: 600
Description: Operational Heaters
Comments:

Product Var Name i_MechSys_c
Is element of: GLA03 Main Record
Short Description: Mechanical System Current
Product Data Type: i4b (4)
Total Bytes: 16
Product Units: Amps X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 800
Product Maximum: 1200
Description: Mechanical System
Comments:

Product Var Name i_BusBL1_v
Is element of: GLA03 Main Record
Short Description: +28V Bus B Laser 1 Voltage
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: Volts X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 2400
Product Maximum: 3200
Description: +28V Bus B Laser 1
Comments:

Product Var Name i_BusBL1_c
Is element of: GLA03 Main Record
Short Description: +28V Bus B Laser 1 Current
Product Data Type: i4b (4)
Total Bytes: 16
Product Units: Amps X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 800
Product Maximum: 1200
Description: +28V Bus B Laser 1

Comments:

Product Var Name i_BusCL2_v
Is element of: GLA03 Main Record
Short Description: +28V Bus C Laser 2 Voltage
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: Volts X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 2400
Product Maximum: 3200
Description: +28V Bus C Laser 2
Comments:

Product Var Name i_BusCL2_c
Is element of: GLA03 Main Record
Short Description: +28V Bus C Laser 2 Current
Product Data Type: i4b (4)
Total Bytes: 16
Product Units: Amps X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 800
Product Maximum: 1200
Description: +28V Bus C Laser 2
Comments:

Product Var Name i_BusDL3_v
Is element of: GLA03 Main Record
Short Description: +28V Bus D Laser 3 Voltage
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: Volts X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 2400

Product Maximum: 3200
Description: +28V Bus D Laser 3
Comments:

Product Var Name i_BusDL3_c
Is element of: GLA03 Main Record
Short Description: +28V Bus D Laser 3 Voltage
Product Data Type: i4b (4)
Total Bytes: 16
Product Units: Amps X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 800
Product Maximum: 1200
Description: +28V Bus D Laser 3
Comments:

Product Var Name i_5VHb1_v
Is element of: GLA03 Main Record
Short Description: + 5 V Hybrid # 1 Voltage
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: Volts X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 400
Product Maximum: 600
Description: + 5 V Hybrid # 1
Comments:

Product Var Name i_5VHb1_c
Is element of: GLA03 Main Record
Short Description: + 5 V Hybrid # 1 Current
Product Data Type: i4b (4)
Total Bytes: 16
Product Units: Amps X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA

Is Unsigned?: No
Product Minimum: 50
Product Maximum: 150
Description: + 5 V Hybrid # 1
Comments:

Product Var Name i_12VHb2_v
Is element of: GLA03 Main Record
Short Description: +12 V Hybrid # 2 Voltage
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: Volts X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 1100
Product Maximum: 1300
Description: +12 V Hybrid # 2
Comments:

Product Var Name i_12VHb2_c
Is element of: GLA03 Main Record
Short Description: + 12 V Hybrid # 2 Current
Product Data Type: i4b (4)
Total Bytes: 16
Product Units: Amps X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 150
Product Maximum: 250
Description: + 12 V Hybrid # 2
Comments:

Product Var Name i_n12VHb3_v
Is element of: GLA03 Main Record
Short Description: - 12 V Hybrid # 3 Voltage
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: Volts X 100

Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1300
Product Maximum: -1100
Description: - 12 V Hybrid # 3
Comments:

Product Var Name i_n12VHb3_c
Is element of: GLA03 Main Record
Short Description: - 12 V Hybrid # 3 Current
Product Data Type: i4b (4)
Total Bytes: 16
Product Units: Amps X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 250
Description: - 12 V Hybrid # 3
Comments:

Product Var Name i_5VHb4_v
Is element of: GLA03 Main Record
Short Description: + 5 V Hybrid # 4 Voltage
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: Volts X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 400
Product Maximum: 600
Description: + 5 V Hybrid # 4
Comments:

Product Var Name i_5VHb4_c
Is element of: GLA03 Main Record
Short Description: + 5 V Hybrid # 4 Current
Product Data Type: i4b (4)

Total Bytes: 16
Product Units: Amps X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 50
Product Maximum: 150
Description: + 5 V Hybrid # 4
Comments:

Product Var Name i_n5VHb5_v
Is element of: GLA03 Main Record
Short Description: - 5 V Hybrid # 5 Voltage
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: Volts X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -600
Product Maximum: -400
Description: - 5 V Hybrid # 5
Comments:

Product Var Name i_n5VHb5_c
Is element of: GLA03 Main Record
Short Description: - 5 V Hybrid # 5 Current
Product Data Type: i4b (4)
Total Bytes: 16
Product Units: Amps X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 150
Description: - 5 V Hybrid # 5
Comments:

Product Var Name i_n5VHb6_v
Is element of: GLA03 Main Record

Short Description: - 5 V Hybrid # 6 Voltage
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: Volts X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -600
Product Maximum: -400
Description: - 5 V Hybrid # 6
Comments:

Product Var Name i_n5VHb6_c
Is element of: GLA03 Main Record
Short Description: - 5 V Hybrid # 6 Current
Product Data Type: i4b (4)
Total Bytes: 16
Product Units: Amps X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 150
Description: - 5 V Hybrid # 6
Comments:

Product Var Name i_15VBPR_v
Is element of: GLA03 Main Record
Short Description: + 15 V Boost Post Register Voltage
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: Volts X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 1400
Product Maximum: 1600
Description: + 15 V Boost Post Reg
Comments:

Product Var Name i_n15VBPR_v
Is element of: GLA03 Main Record
Short Description: - 15 V Boost Post Register Current
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: Volts X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1600
Product Maximum: -1400
Description: - 15 V Boost Post Reg
Comments:

Product Var Name i_12VPOscTC_c
Is element of: GLA03 Main Record
Short Description: 12V Prim Osc Thermal Control
Product Data Type: i4b (4)
Total Bytes: 16
Product Units: Amps X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 150
Product Maximum: 250
Description: +12 V Prim Osc Thermal Control
Comments:

Product Var Name i_12VSOscTC_c
Is element of: GLA03 Main Record
Short Description: 12V Sec Osc Thermal Control
Product Data Type: i4b (4)
Total Bytes: 16
Product Units: Amps X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 150
Product Maximum: 250
Description: +12 V Sec Osc Thermal Control

Comments:

Product Var Name i_n2VDV_v
Is element of: GLA03 Main Record
Short Description: -2 V Discrete Voltage
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: Volts X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -300
Product Maximum: -100
Description: -2 V Discrete Voltage
Comments:

Product Var Name i_HbHS_t
Is element of: GLA03 Main Record
Short Description: Hybrid Heatsink Temperature
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 3000
Description: Hybrid Heatsink
Comments:

Product Var Name i_FETSbHS_t
Is element of: GLA03 Main Record
Short Description: FET Switch Bank Heatsink Temperature
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0

Product Maximum: 3000

Description: FET Switch Bank Heatsink

Comments:

Product Var Name i_PrimOsc_Stat

Is element of: GLA03 Main Record

Short Description: Primary Oscillator Status

Product Data Type: i1b (4)

Total Bytes: 4

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1

Description: Status of Primary Oscillator from FET switch bank status. Value of 0 indicates off; value of 1 indicates on.

Comments:

Product Var Name i_SecOsc_Stat

Is element of: GLA03 Main Record

Short Description: Secondary Oscillator Status

Product Data Type: i1b (4)

Total Bytes: 4

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1

Description: Status of secondary Oscillator from FET switch bank status. Value of 0 indicates off; value of 1 indicates on.

Comments:

Product Var Name i_PrimAD_Stat

Is element of: GLA03 Main Record

Short Description: Primary Altimeter Digitizer Status

Product Data Type: i1b (4)

Total Bytes: 4

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1

Description: Status of Primary altimeter digitizer from FET switch bank status. Value of 0 indicates off; value of 1 indicates on.

Comments:

Product Var Name i_SecAD_Stat

Is element of: GLA03 Main Record

Short Description: Secondary Altimeter Digitizer Status

Product Data Type: i1b (4)

Total Bytes: 4

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1

Description: Status of secondary altimeter digitizer from FET switch bank status. Value of 0 indicates off; value of 1 indicates on.Comments:

Product Var Name i_0VHVPSRef_v

Is element of: GLA03 Main Record

Short Description: HVPS +0 Volts Reference Voltage

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: Volts X 100

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -500

Product Maximum: 500

Description: HVPS +0 Volts Reference

Comments:

Product Var Name i_5VHVPSRef_v

Is element of: GLA03 Main Record

Short Description: HVPS +5 V Reference Voltage

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: Volts X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 1000
Description: HVPS +5 V Reference
Comments:

Product Var Name i_OptSensSt
Is element of: GLA03 Main Record
Short Description: Optical Sensor Status
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 4095
Description: Indicates status of primary and secondary laser select mechanisms and altimeter digitizer detectors.
Comments:

Product Var Name i_CmdTlmStat
Is element of: GLA03 Main Record
Short Description: Command Telemetry Status
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 65535
Description: Status of MCS board commandable telemetry.
Comments:

Product Var Name i_PDUPMonCal1
Is element of: GLA03 Main Record
Short Description: Primary Monitor Calibration

Product Data Type: i1b (4)
Total Bytes: 4
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 255
Description: Primary Monitor Calibration
Comments:

Product Var Name i_PDUPMonCal2
Is element of: GLA03 Main Record
Short Description: Primary Monitor Calibration
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 255
Description: Primary Monitor Calibration
Comments:

Product Var Name i_PDUSMonCal1
Is element of: GLA03 Main Record
Short Description: Secondary Monitor Calibration
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 255
Description: Secondary Monitor Calibration
Comments:

Product Var Name i_PDUSMonCal2

Is element of: GLA03 Main Record
Short Description: Secondary Monitor Calibration
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 255
Description: Secondary Monitor Calibration
Comments:

Product Var Name i_ctrinfo
Is element of: GLA03 Main Record
Short Description: Counter info
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: Counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 15
Description: MCS MUX Counter (only uses 4 lower bits).
Comments:

Product Var Name i_phdr_22
Is element of: GLA03 Main Record
Short Description: Primary Header APID 22
Product Data Type: i1b (6)
Total Bytes: 6
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: null
Product Maximum: null
Description: Primary Header APID 22
Comments:

Product Var Name i_shdr_22
Is element of: GLA03 Main Record
Short Description: Secondary Header APID 22 (time stamp)
Product Data Type: i1b (8)
Total Bytes: 8
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: null
Product Maximum: null
Description: Secondary Header APID 22 (time stamp)
Comments:

Product Var Name i_HkBdC0_t
Is element of: GLA03 Main Record
Short Description: Housekeeping Board Temperature, Ch 0
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000
Product Maximum: 4000
Description: Housekeeping Board Temperature, Ch 0
Comments:

Product Var Name i_IPSBdC1_t
Is element of: GLA03 Main Record
Short Description: Instrument Processor System Board Temperature, Ch 1
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000
Product Maximum: 4000

Description: Instrument Processor System Board Temperature, Ch 1
Comments:

Product Var Name i_PCBdC2_t
Is element of: GLA03 Main Record
Short Description: Photon Counter Board Temperature, Ch 2
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000
Product Maximum: 4000
Description: Photon Counter Board Temperature, Ch 2
Comments:

Product Var Name i_CDFTBdC3_t
Is element of: GLA03 Main Record
Short Description: Cloud Digitizer/Frequency & Time Board Temperature, Ch 3
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000
Product Maximum: 4000
Description: Cloud Digitizer/Frequency & Time Board Temperature, Ch 3
Comments:

Product Var Name i_AD1DSPC4_t
Is element of: GLA03 Main Record
Short Description: Altimeter Digitizer 1 DSP Temperature, Ch 4
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No

Product Minimum: -1000
Product Maximum: 4000
Description: Altimeter Digitizer 1 Board Temperature, Ch 4
Comments:

Product Var Name i_AD2DSPC5_t
Is element of: GLA03 Main Record
Short Description: Altimeter Digitizer 2 DSP Temperature, Ch 5
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000
Product Maximum: 4000
Description: Altimeter Digitizer 2 Board Temperature, Ch 5
Comments:

Product Var Name i_DCHBdC6_t
Is element of: GLA03 Main Record
Short Description: Data Collection & Handling Board Temperature, Ch6
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000
Product Maximum: 4000
Description: Altimeter Digitizer 2 Board Temperature 1, Ch 6
Comments:

Product Var Name i_LMBdC7_t
Is element of: GLA03 Main Record
Short Description: Laser Monitor Board Temperature, Ch 7
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000
Product Maximum: 4000
Description: Altimeter Digitizer 2 Board Temperature 2, Ch 7
Comments:

Product Var Name i_TCMBdC8_t
Is element of: GLA03 Main Record
Short Description: Temperature Controller Monitor Board Temperature, Ch 8
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000
Product Maximum: 4000
Description: Data Collection & Handling Board Temperature, Ch 8
Comments:

Product Var Name i_OXCO1BdC9_t
Is element of: GLA03 Main Record
Short Description: Oven-crystal-controlled Oscillator (OXCO) 1 Board Temperature, Ch 9
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000
Product Maximum: 4000
Description: Laser Monitor Board Temperature, Ch 9
Comments:

Product Var Name i_OXCO2BdC10_t
Is element of: GLA03 Main Record
Short Description: Oven-crystal-controlled Oscillator (OXCO) 2 Board Temperature, Ch 10
Product Data Type: i2b
Total Bytes: 2

Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000
Product Maximum: 4000
Description: Temperature Controller Monitor Board Temperature, Ch 10
Comments:

Product Var Name i_OscBdC11_t
Is element of: GLA03 Main Record
Short Description: Oscillator Board Temperature, Ch 11
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000
Product Maximum: 4000
Description: Oven-crystal-controlled Oscillator (OXCO) 1 Board Temperature, Ch 11
Comments:

Product Var Name i_OTSBdC12_t
Is element of: GLA03 Main Record
Short Description: Optical Test Source (OTS) Board Temperature, Ch 12
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000
Product Maximum: 4000
Description: Oven-crystal-controlled Oscillator (OXCO) 2 Board Temperature, Ch 12
Comments:

Product Var Name i_LPAC13_t1
Is element of: GLA03 Main Record, GLA04 LRS Main Record
Short Description: Laser Profiler Array (LPA) Temperature 1, Ch 13

Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000
Product Maximum: 4000
Description: Oscillator Board Temperature, Ch 13
Comments:

Product Var Name i_LPAC14_t2
Is element of: GLA03 Main Record
Short Description: Laser Profiler Array (LPA) Temperature 2, Ch 14
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000
Product Maximum: 4000
Description: Optical Test Source (OTS) Board Temperature, Ch 14
Comments:

Product Var Name i_AD1eclaC15_t
Is element of: GLA03 Main Record
Short Description: Altimeter Digitizer 1 ECLA Temperature, Ch 15
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000
Product Maximum: 4000
Description: Laser Profiler Array (LPA) Temperature 1, Ch 15
Comments:

Product Var Name i_AD2eclaC16_t

Is element of: GLA03 Main Record
Short Description: Altimeter Digitizer 2 ECLA Temperature, Ch 16
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000
Product Maximum: 4000
Description: Laser Profiler Array (LPA) Temperature 2, Ch 16
Comments:

Product Var Name i_AD1eclbC17_t
Is element of: GLA03 Main Record
Short Description: Altimeter Digitizer 1 ECLB Temperature, Ch 17
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000
Product Maximum: 4000
Description: Altimeter Digitizer 1 Board Temperature 3, Ch 17
Comments:

Product Var Name i_AD2eclbC18_t
Is element of: GLA03 Main Record
Short Description: Altimeter Digitizer 2 ECLB Temperature, Ch 18
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000
Product Maximum: 4000
Description: Altimeter Digitizer 2 Board Temperature 3, Ch 18
Comments:

Product Var Name i_AD1ADCC19_t
Is element of: GLA03 Main Record
Short Description: Altimeter Digitizer 1 ADC Temperature, Ch 19
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000
Product Maximum: 4000
Description: Altimeter Digitizer 1 Board Temperature 4, Ch 19
Comments:

Product Var Name i_AD2ADCC20_t
Is element of: GLA03 Main Record
Short Description: Altimeter Digitizer 2 ADC Temperature, Ch 20
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000
Product Maximum: 4000
Description: Altimeter Digitizer 2 Board Temperature 4, Ch 20
Comments:

Product Var Name i_lid_box_t
Is element of: GLA03 Main Record
Short Description: Lidar Box Temperature
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000
Product Maximum: 4000

Description: Lidar Box Temperature
Comments:

Product Var Name i_PRTtelmtC22t
Is element of: GLA03 Main Record
Short Description: PRT, Telescope Mount Temperature, Ch 22
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000
Product Maximum: 4000
Description: Altimeter Digitizer 2 Board Temperature 5, Ch 22
Comments:

Product Var Name i_PRTtelbfC23t
Is element of: GLA03 Main Record
Short Description: PRT, Telescope Baffle Temperature, Ch 23
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000
Product Maximum: 4000
Description: HK Tlm Channel 23- Spare
Comments:

Product Var Name i_PRTad1C24_t
Is element of: GLA03 Main Record
Short Description: PRT, Altimeter Detector 1 Temperature, Ch 24
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No

Product Minimum: 0
Product Maximum: 5000
Description: PRT, Gyro Temperature, Ch 24
Comments:

Product Var Name i_PRTad2C25_t
Is element of: GLA03 Main Record
Short Description: PRT, Altimeter Detector 2 Temperature, Ch 25
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 5000
Description: PRT, Star Camera Temperature, Ch 25
Comments:

Product Var Name iF1LTRSRSC26_t
Is element of: GLA03 Main Record, GLA04 LRS Main Record
Short Description: PRT, Face 1 LTR to SRS Temperature, Ch26
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 5000
Description: PRT, Stellar Reference System (SRS) Temperature, Ch 26
Comments:

Product Var Name iF2LTRSRSC27_t
Is element of: GLA03 Main Record, GLA04 LRS Main Record
Short Description: PRT, Face 2 LTR to SRS Temperature, Ch27
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 5000
Description: PRT, Lidar Detector Pkg? Temperature, Ch 27
Comments:

Product Var Name i_srs_ff_optio_t
Is element of: GLA03 Main Record, GLA04 LRS Main Record
Short Description: SRS First Fold Optics Temperature
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 5000
Description: SRS First Fold Optics Temperature
Comments:

Product Var Name i_PRTfboxC29_t
Is element of: GLA03 Main Record
Short Description: PRT, Fiber Box Temperature, Ch 29
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 5000
Description: PRT, Altimeter Detector 2 Temperature, Ch 29
Comments:

Product Var Name i_F1fabC30_t
Is element of: GLA03 Main Record
Short Description: PRT, Face 1 Fold Around Bench Temperature, Ch 30
Product Data Type: i2b
Total Bytes: 2

Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 5000
Description: PRT, Spacecraft Interface Temperature, Ch 30
Comments:

Product Var Name i_F2fabC31_t
Is element of: GLA03 Main Record
Short Description: PRT, Face 2 Fold Around Bench Temperature, Ch 31
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 5000
Description: PRT, Telescope Mount Temperature, Ch 31
Comments:

Product Var Name iF1LTRCRSC32_t
Is element of: GLA03 Main Record
Short Description: PRT, Face 1 LTR CRS Temperature, Ch 32
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 5000
Description: PRT, Telescope Baffle Temperature, Ch 32
Comments:

Product Var Name iF2LTRCRSC33_t
Is element of: GLA03 Main Record
Short Description: PRT, Face 2 LTR CRS Temperature, Ch 33

Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 5000
Description: PRT Temperature Region 10, Ch 33, Spare
Comments:

Product Var Name i_SRSparC34_t
Is element of: GLA03 Main Record
Short Description: PRT, Stellar Reference System (SRS) Parabola Temperature, Ch 34
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 5000
Description: PRT Temperature Region 11, Ch 34, Spare
Comments:

Product Var Name i_PRTCalLC35_t
Is element of: GLA03 Main Record
Short Description: PRT Cal Low Temperature, Ch 35
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 5000
Description: PRT Cal Low Temperature, Ch 35
Comments:

Product Var Name i_PRTCalHC36_t

Is element of: GLA03 Main Record
Short Description: PRT Cal High Temperature, Ch 36
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 5000
Description: PRT Cal High Temperature, Ch 36
Comments:

Product Var Name i_PDBiasC38_v
Is element of: GLA03 Main Record
Short Description: Pin Diode Bias Voltage, Ch 38
Product Data Type: i2b
Total Bytes: 2
Product Units: Volt X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 1200
Description: Pin Diode Bias Voltage, Ch 38
Comments:

Product Var Name iAD1HSRamC39_t
Is element of: GLA03 Main Record
Short Description: AD1 High Speed Ram Temperature, Ch 39
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 1200
Description: AD1 High Speed Ram Temperature, Ch 39
Comments:

Product Var Name i_spare22_1

Is element of: GLA03 Main Record

Short Description: Spare22 1

Product Data Type: i1b (12)

Total Bytes: 12

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: Spares in telemetry packet. 3 1-byte spares: GHKSPARE1-GHKSPARE5.

Product Var Name i_phdr_23

Is element of: GLA03 Main Record

Short Description: Primary Header APID 23

Product Data Type: i1b (6)

Total Bytes: 6

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: Primary Header APID 23

Comments:

Product Var Name i_shdr_23

Is element of: GLA03 Main Record

Short Description: Secondary Header APID 23 (time stamp)

Product Data Type: i1b (8)

Total Bytes: 8

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: Secondary Header APID 23 (time stamp)

Comments:

Product Var Name i_tlm_spare1

Is element of: GLA03 Main Record

Short Description: TLM Spare1

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_lsm1_t

Is element of: GLA03 Main Record

Short Description: Laser Select Mechanism #1 Temperature

Product Data Type: i4b

Total Bytes: 4

Product Units: Celsius X 100

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 2000

Product Maximum: 6000

Description: Laser Select Mechanism #1 Temperature

Comments:

Product Var Name i_lsm2_t

Is element of: GLA03 Main Record

Short Description: Laser Select Mechanism #2 Temperature

Product Data Type: i4b

Total Bytes: 4

Product Units: Celsius X 100

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 2000
Product Maximum: 6000
Description: Laser Select Mechanism #2 Temperature
Comments:

Product Var Name i_adsm_t
Is element of: GLA03 Main Record
Short Description: Altimeter Detector Select Mechanism Temperature
Product Data Type: i4b
Total Bytes: 4
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 2000
Product Maximum: 6000
Description: Altimeter Detector Select Mechanism Temperature
Comments:

Product Var Name i_lbsme_t
Is element of: GLA03 Main Record
Short Description: Laser Beam Select Mech Electronics Temperature
Product Data Type: i4b
Total Bytes: 4
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 2000
Product Maximum: 6000
Description: Laser Beam Select Mech Electronics Temperature
Comments:

Product Var Name i_lbsmm_t
Is element of: GLA03 Main Record
Short Description: Laser Beam Select Mechanism Mirror Temperature
Product Data Type: i4b
Total Bytes: 4
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 2000
Product Maximum: 6000
Description: Laser Beam Select Mechanism Mirror Temperature
Comments:

Product Var Name i_HOP1ActH1_c
Is element of: GLA03 Main Record
Short Description: HOP 1 Actuator Current - Heater 1
Product Data Type: i4b
Total Bytes: 4
Product Units: Amps X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 800
Product Maximum: 1000
Description: HOP 1 Actuator Current - Heater 1
Comments:

Product Var Name i_HOP1ActH2_c
Is element of: GLA03 Main Record
Short Description: HOP 1 Actuator Current - Heater 2
Product Data Type: i4b
Total Bytes: 4
Product Units: Amps X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 800
Product Maximum: 1000
Description: HOP 1 Actuator Current - Heater 2
Comments:

Product Var Name i_HOP2ActH1_c
Is element of: GLA03 Main Record
Short Description: HOP 2 Actuator Current - Heater 1
Product Data Type: i4b
Total Bytes: 4

Product Units: Amps X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 800
Product Maximum: 1000
Description: HOP 2 Actuator Current - Heater 1
Comments:

Product Var Name i_HOP2ActH2_c
Is element of: GLA03 Main Record
Short Description: HOP 2 Actuator Current - Heater 2
Product Data Type: i4b
Total Bytes: 4
Product Units: Amps X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 800
Product Maximum: 1000
Description: HOP 2 Actuator Current - Heater 2
Comments:

Product Var Name i_HOP3ActH1_c
Is element of: GLA03 Main Record
Short Description: HOP 3 Actuator Current - Heater 1
Product Data Type: i4b
Total Bytes: 4
Product Units: Amps X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 800
Product Maximum: 1000
Description: HOP 3 Actuator Current - Heater 1
Comments:

Product Var Name i_HOP3ActH2_c
Is element of: GLA03 Main Record
Short Description: HOP 3 Actuator Current - Heater 2

Product Data Type: i4b
Total Bytes: 4
Product Units: Amps X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 800
Product Maximum: 1000
Description: HOP 3 Actuator Current - Heater 2
Comments:

Product Var Name iTsPMirHtrStPt
Is element of: GLA03 Main Record
Short Description: Telescope Primary Mirror Heater Temperature Setpoint
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000
Product Maximum: 5000
Description: Telescope Primary Mirror Heater Temp Setpoint Readback
Comments:

Product Var Name iTsTwrHtrStPt
Is element of: GLA03 Main Record
Short Description: Telescope Tower Heater Temperature Setpoint
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000
Product Maximum: 5000
Description: Telescope Tower Heater Temperature Setpoint Readback
Comments:

Product Var Name i_EtHtr_StPt

Is element of: GLA03 Main Record
Short Description: Etalon Heater Temperature Setpoint
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000
Product Maximum: 5000
Description: Etalon Heater Temperature Setpoint Readback
Comments:

Product Var Name i_LHP1_StPt
Is element of: GLA03 Main Record
Short Description: Loop Heat Pipe 1 Temperature Setpoint
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000
Product Maximum: 5000
Description: Loop Heat Pipe 1 Temperature Setpoint Readback
Comments:

Product Var Name i_LHP2_StPt
Is element of: GLA03 Main Record
Short Description: Loop Heat Pipe 2 Temperature Setpoint
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000
Product Maximum: 5000
Description: Loop Heat Pipe 2 Temperature Setpoint Readback
Comments:

Product Var Name i_TsPMirHtr_St
Is element of: GLA03 Main Record
Short Description: Telescope Primary Mirror Heater Status
Product Data Type: i1b
Total Bytes: 1
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 255
Description: Telescope Primary Mirror Heater Enable Readback. 0 = Disabled; 0xFF = Enabled.
Comments:

Product Var Name i_TsTwrHtr_St
Is element of: GLA03 Main Record
Short Description: Telescope Tower Heater Status
Product Data Type: i1b
Total Bytes: 1
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 255
Description: Telescope Tower Heater Enable Readback. 0 = Disabled; 0xFF = Enabled.
Comments:

Product Var Name i_EtHtr_St
Is element of: GLA03 Main Record
Short Description: Etalon Heater Status
Product Data Type: i1b
Total Bytes: 1
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 255

Description: Etalon Heater Enable Readback. 0 = Disabled; 0xFF = Enabled.
Comments:

Product Var Name i_LHP1_St
Is element of: GLA03 Main Record
Short Description: Loop Heat Pipe 1 Status
Product Data Type: i1b
Total Bytes: 1
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 255
Description: Loop Heat Pipe 1 Enable Readback. 0 = Disabled; 0xFF = Enabled.
Comments:

Product Var Name i_LHP2_St
Is element of: GLA03 Main Record
Short Description: Loop Heat Pipe 2 Status
Product Data Type: i1b
Total Bytes: 1
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 255
Description: Loop Heat Pipe 2 Enable Readback. 0 = Disabled; 0xFF = Enabled.
Comments:

Product Var Name i_TsPMir_sTh
Is element of: GLA03 Main Record
Short Description: Telescope Primary Mirror Selected Thermistor
Product Data Type: i1b
Total Bytes: 1
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: Thermistor Select - Telescope Primary Mirror - Status Readback. 0 = Thermistor 1; 0xFF = Thermistor 2.

Comments:

Product Var Name i_TsSecSS_sTh

Is element of: GLA03 Main Record

Short Description: Telescope Secondary Support Structure Selected Thermistor

Product Data Type: i1b

Total Bytes: 1

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: Thermistor Select Telescope Secondary Support Structure Status Readback. 0 = Thermistor 1; 0xFF = Thermistor 2.

Comments:

Product Var Name i_TsSMir_sTh

Is element of: GLA03 Main Record

Short Description: Telescope Secondary Mirror Selected Thermistor

Product Data Type: i1b

Total Bytes: 1

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: Thermistor Select - Telescope Secondary Mirror - Status Readback. 0 = Thermistor 1; 0xFF = Thermistor 2.

Comments:

Product Var Name i_LHP1_sTh

Is element of: GLA03 Main Record

Short Description: LHP1 Selected Thermistor

Product Data Type: i1b

Total Bytes: 1

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: Thermistor Select LHP1 (lasers) Status Readback. 0 = Thermistor 1; 0xFF = Thermistor 2.

Comments:

Product Var Name i_LHP2_sTh

Is element of: GLA03 Main Record

Short Description: LHP2 Selected Thermistor

Product Data Type: i1b

Total Bytes: 1

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: Thermistor Select LHP2 (rest of instrument) Status Readback. 0 = Thermistor 1; 0xFF = Thermistor 2.

Comments:

Product Var Name i_Et_sTh

Is element of: GLA03 Main Record

Short Description: Etalon Selected Thermistor

Product Data Type: i1b

Total Bytes: 1

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: Thermistor Select Etalon Status Readback. 0 = Thermistor 1; 0xFF = Thermistor 2.

Comments:

Product Var Name i_tlm_spare2

Is element of: GLA03 Main Record

Short Description: TLM Spare2

Product Data Type: i1b

Total Bytes: 1

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_LHtP12_St

Is element of: GLA03 Main Record

Short Description: Loop Heat Pipe 1 & 2 Heater Status

Product Data Type: i1b

Total Bytes: 1

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 3

Description: Loop Heat Pipe 1 & 2 Heater Status; Pipe 1 -> Bit 0, LSB, Pipe 2 -> Bit 1; 0=OFF, 1=ON; spares -> Bits 2-7Comments:

Product Var Name i_spare23_1

Is element of: GLA03 Main Record

Short Description: Spare23 1

Product Data Type: i1b

Total Bytes: 1

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: Spares in telemetry packet. 3 1-byte spares: GHKSPARE1-GHKSPARE5.

Product Var Name i_phdr_50
Is element of: GLA03 Main Record
Short Description: Primary Header APID 50
Product Data Type: i1b (6)
Total Bytes: 6
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: null
Product Maximum: null
Description: Primary Header APID 50
Comments:

Product Var Name i_shdr_50
Is element of: GLA03 Main Record
Short Description: Secondary Header APID 50 (time stamp)
Product Data Type: i1b (8)
Total Bytes: 8
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: null
Product Maximum: null
Description: Secondary Header APID 50 (time stamp)
Comments:

Product Var Name i_TsPMir_t
Is element of: GLA03 Main Record, GLA04 LRS Main Record
Short Description: Telescope Region 0 Primary Mirror Temperature
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000
Product Maximum: 3000
Description: Telescope Region 0 Primary Mirror

Comments:

Product Var Name i_TsSMir_t
Is element of: GLA03 Main Record, GLA04 LRS Main Record
Short Description: Telescope Region 1 Secondary Mirror Temperature
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000
Product Maximum: 3000
Description: Telescope Region 1 Secondary Mirror
Comments:

Product Var Name i_TsTwr_t
Is element of: GLA03 Main Record
Short Description: Telescope Region 2 Tower Temperature
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000
Product Maximum: 3000
Description: Telescope Region 2 Tower
Comments:

Product Var Name i_EtC37d_t
Is element of: GLA02 Record, GLA03 Main Record
Short Description: Etalon Temperature, Ch 37d
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000

Product Maximum: 3000
Description: Etalon Temperature, Ch 37d
Comments:

Product Var Name i_LHP1C37e_t
Is element of: GLA03 Main Record
Short Description: Loop Heat Pipe 1 Temperature, Ch 37e
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000
Product Maximum: 3000
Description: Loop Heat Pipe 1 Temperature, Ch 37e
Comments:

Product Var Name i_LHP2C37f_t
Is element of: GLA03 Main Record
Short Description: Loop Heat Pipe 2 Temperature, Ch 37f
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000
Product Maximum: 3000
Description: Loop Heat Pipe 2 Temperature, Ch 37f
Comments:

Product Var Name i_TsPMirHDr_c
Is element of: GLA03 Main Record
Short Description: Telescope Primary Mirror Heater drive current
Product Data Type: i2b
Total Bytes: 2
Product Units: Amps X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA

Is Unsigned?: No
Product Minimum: 0
Product Maximum: 2500
Description: Telescope Primary Mirror Heater drive current
Comments:

Product Var Name i_TsTwrHDr_c
Is element of: GLA03 Main Record
Short Description: Telescope Tower Heater drive current
Product Data Type: i2b
Total Bytes: 2
Product Units: Amps X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 2500
Description: Telescope Tower Heater drive current
Comments:

Product Var Name i_EtHtrC37j_c
Is element of: GLA02 Record, GLA03 Main Record
Short Description: Etalon Heater Current, Ch 37j
Product Data Type: i2b
Total Bytes: 2
Product Units: Amps X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 2500
Description: Etalon Heater Current, Ch 37j
Comments:

Product Var Name i_DlyLineAll_t
Is element of: GLA03 Main Record
Short Description: Delay Line All Temperature
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100

Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000
Product Maximum: 3000
Description: Delay Line All Temperature from Laser Monitor Board.
Comments:

Product Var Name i_DlyLineMid_t
Is element of: GLA03 Main Record
Short Description: Delay Line Mid Temperature
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000
Product Maximum: 3000
Description: Delay Line Mid Temperature from Laser Monitor Board.
Comments:

Product Var Name i_DlyLineHi_t
Is element of: GLA03 Main Record
Short Description: Delay Line Hi Temperature
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000
Product Maximum: 3000
Description: Delay Line Hi Temperature from Laser Monitor Board.
Comments:

Product Var Name i_OTSL1_rb
Is element of: GLA03 Main Record
Short Description: OTS Level1 readback
Product Data Type: i1b

Total Bytes: 1
Product Units: Counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 100
Description:
Comments:

Product Var Name i_OTSL2_rb
Is element of: GLA03 Main Record
Short Description: OTS Level 2 readback
Product Data Type: i1b
Total Bytes: 1
Product Units: Counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 100
Description:
Comments:

Product Var Name i_OTSL3_rb
Is element of: GLA03 Main Record
Short Description: OTS Level 3 readback
Product Data Type: i1b
Total Bytes: 1
Product Units: Counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 100
Description:
Comments:

Product Var Name i_OTSL4_rb
Is element of: GLA03 Main Record

Short Description: OTS Level 4 readback

Product Data Type: i1b

Total Bytes: 1

Product Units: Counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 100

Description:

Comments:

Product Var Name i_OTS_tc1

Is element of: GLA03 Main Record

Short Description: OTS Trigger Count 1 readback

Product Data Type: i2b

Total Bytes: 2

Product Units: Counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 10000

Description: The OTS trigger count 1 readback upper and lower byte. 1st item is the lower byte, 2nd item is the upper byte.

Comments:

Product Var Name i_OTS_tc2

Is element of: GLA03 Main Record

Short Description: OTS Trigger Count 2 readback

Product Data Type: i2b

Total Bytes: 2

Product Units: Counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 10000

Description: The OTS trigger count 2 readback upper and lower byte. 1st item is the lower byte, 2nd item is the upper byte.

Comments:

Product Var Name i_tlm_spare501

Is element of: GLA03 Main Record

Short Description: TLM Spare501

Product Data Type: i1b

Total Bytes: 1

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_spare50

Is element of: GLA03 Main Record

Short Description: Spare 50

Product Data Type: i1b (21)

Total Bytes: 21

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Spares in telemetry packet. 29 1-byte spares: GHW5SPR[29].

Comments:

Product Var Name i_phdr_24

Is element of: GLA03 Main Record

Short Description: Primary Header APID 24

Product Data Type: i1b (6, 4)

Total Bytes: 24

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null
Product Maximum: null
Description: Primary Header APID 23
Comments:

Product Var Name i_shdr_24
Is element of: GLA03 Main Record
Short Description: Secondary Header APID 24 (time stamp)
Product Data Type: i1b (8, 4)
Total Bytes: 32
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: null
Product Maximum: null
Description: Secondary Header APID 23 (time stamp)
Comments:

Product Var Name iHS_CmdProc
Is element of: GLA03 Main Record
Short Description: HS Task Cmd Processed Counter
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: HS Task Cmd Processed Counter
Comments:

Product Var Name iHS_CmdRej
Is element of: GLA03 Main Record
Short Description: HS Task Cmd Rejected (or Error) Counter
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: HS Task Cmd Rejected (or Error) Counter
Comments:

Product Var Name iCS_CmdProc
Is element of: GLA03 Main Record
Short Description: CS Task Cmd Processed Counter
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: CS Task Cmd Processed Counter
Comments:

Product Var Name iCS_CmdRej
Is element of: GLA03 Main Record
Short Description: CS Task Cmd Rejected (or Error) Counter
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: CS Task Cmd Rejected (or Error) Counter
Comments:

Product Var Name iTC_CmdProc
Is element of: GLA03 Main Record
Short Description: TC Task Cmd Processed Counter
Product Data Type: i1b (4)
Total Bytes: 4

Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: TC Task Cmd Processed Counter
Comments:

Product Var Name iTC_CmdRej
Is element of: GLA03 Main Record
Short Description: TC Task Cmd Rejected (or Error) Counter
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: TC Task Cmd Rejected (or Error) Counter
Comments:

Product Var Name iSB_CmdProc
Is element of: GLA03 Main Record
Short Description: SB Task Cmd Processed Counter
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: SB Task Cmd Processed Counter
Comments:

Product Var Name iSB_CmdRej
Is element of: GLA03 Main Record
Short Description: SB Task Cmd Rejected (or Error) Counter

Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: SB Task Cmd Rejected (or Error) Counter
Comments:

Product Var Name iSM_CmdProc
Is element of: GLA03 Main Record
Short Description: SM Task Cmd Processed Counter
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: SM Task Cmd Processed Counter
Comments:

Product Var Name iSM_CmdRej
Is element of: GLA03 Main Record
Short Description: SM Task Cmd Rejected (or Error) Counter
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: SM Task Cmd Rejected (or Error) Counter
Comments:

Product Var Name iRT_CmdProc

Is element of: GLA03 Main Record
Short Description: RT Task Cmd Processed Counter
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: RT Task Cmd Processed Counter
Comments:

Product Var Name iRT_CmdRej
Is element of: GLA03 Main Record
Short Description: RT Task Cmd Rejected (or Error) Counter
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: RT Task Cmd Rejected (or Error) Counter
Comments:

Product Var Name iRT_RCH3CmdRcv
Is element of: GLA03 Main Record
Short Description: RT Task RCH3 Commands Received
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: RT Task RCH3 (SA22-25, CSA 26) Commands Received. Does not count spacecraft position and command packet.
Comments:

Product Var Name iRT_RCH3CmdRej

Is element of: GLA03 Main Record

Short Description: RT Task RCH3 Commands Rejected

Product Data Type: i1b (4)

Total Bytes: 4

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 128

Description: RT Task RCH3 (SA22-25, CSA 26) Commands Rejected. Commands are rejected for checksum problems.

Comments:

Product Var Name iMD_CmdProc

Is element of: GLA03 Main Record

Short Description: MD Task Cmd Processed Counter

Product Data Type: i1b (4)

Total Bytes: 4

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 128

Description: MD Task Cmd Processed Counter

Comments:

Product Var Name iMD_CmdRej

Is element of: GLA03 Main Record

Short Description: MD Task Cmd Rejected (or Error) Counter

Product Data Type: i1b (4)

Total Bytes: 4

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 128

Description: MD Task Cmd Rejected (or Error) Counter
Comments:

Product Var Name iAD_CmdProc
Is element of: GLA03 Main Record
Short Description: AD Task Cmd Processed Counter
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: AD Task Cmd Processed Counter
Comments:

Product Var Name iAD_CmdRej
Is element of: GLA03 Main Record
Short Description: AD Task Cmd Rejected (or Error) Counter
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: AD Task Cmd Rejected (or Error) Counter
Comments:

Product Var Name iAD_StatFlag
Is element of: GLA03 Main Record
Short Description: AD Target Status and Mode Flags
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 1

Description: AD Target Status and Mode Flags. 0 = Not present; 1 = Present.

Comments:

Product Var Name i_tlm_spare24

Is element of: GLA03 Main Record

Short Description: TLM Spare24

Product Data Type: i1b (3, 4)

Total Bytes: 12

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name iCD_CCDProc

Is element of: GLA03 Main Record

Short Description: CD Task CCD Processed Counter

Product Data Type: i1b (4)

Total Bytes: 4

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 128

Description: CD Task CCD Processed Counter

Comments:

Product Var Name iCD_CCDRej

Is element of: GLA03 Main Record

Short Description: CD Task CCD Rejected (or Error) Counter

Product Data Type: i1b (4)

Total Bytes: 4

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 128

Description: CD Task CCD Rejected (or Error) Counter

Comments:

Product Var Name iCD_StatusFlag

Is element of: GLA03 Main Record

Short Description: CD Status Flags

Product Data Type: i1b (2, 4)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 255

Description: CD Status Flags. Bits 0-2 indicate CD Mode; 1 = Idle, 2=Engineering, 4=Science, Other values invalid. Bits 3 indicates CD Data Ready Interrupt; 0=Enabled, 1=Disabled. Bits 4 - 5 indicate CD Idle Mode Interrupt Source; 0=Clear Mem, 1=Fire Cmd, 2=Fire Ack, Other values invalid. Bit 6 indicates CD Range Gate Offset Source; 0=Fire Ack, 1= Fire Cmd. Bit 7 is spare.

Comments:

Product Var Name iDC_CmdProc

Is element of: GLA03 Main Record

Short Description: DC Task Cmd Processed Counter

Product Data Type: i1b (4)

Total Bytes: 4

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 128

Description: DC Task Cmd Processed Counter

Comments:

Product Var Name iDC_CmdRej

Is element of: GLA03 Main Record

Short Description: DC Task Cmd Rejected (or Error) Counter

Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: DC Task Cmd Rejected (or Error) Counter
Comments:

Product Var Name iDC_StatFlag
Is element of: GLA03 Main Record
Short Description: DC Status Flags
Product Data Type: i1b (2, 4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 32768
Description: DC Status Flags
Comments:

Product Var Name iGP_CmdProc
Is element of: GLA03 Main Record
Short Description: GP Task Cmd Processed Counter
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: GP Task Cmd Processed Counter
Comments:

Product Var Name iGP_CmdRej

Is element of: GLA03 Main Record
Short Description: GP Task Cmd Rejected (or Error) Counter
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: GP Task Cmd Rejected (or Error) Counter
Comments:

Product Var Name iGP_StatFlag
Is element of: GLA03 Main Record
Short Description: GP Status Flags
Product Data Type: i1b (2, 4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 32768
Description: GP Status Flags
Comments:

Product Var Name iPC_CmdProc
Is element of: GLA03 Main Record
Short Description: PC Task Cmd Processed Counter
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: PC Task Cmd Processed Counter
Comments:

Product Var Name iPC_CmdRej
Is element of: GLA03 Main Record
Short Description: PC Task Cmd Rejected (or Error) Counter
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: PC Task Cmd Rejected (or Error) Counter
Comments:

Product Var Name iPC_StatFlag
Is element of: GLA03 Main Record
Short Description: PC Status Flags
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: PC Status Flags
Comments:

Product Var Name iCT_CmdProc
Is element of: GLA03 Main Record
Short Description: CT Task Cmd Processed Counter
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128

Description: CT Task Cmd Processed Counter

Comments:

Product Var Name iCT_CmdRej

Is element of: GLA03 Main Record

Short Description: CT Task Cmd Rejected (or Error) Counter

Product Data Type: i1b (4)

Total Bytes: 4

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 128

Description: CT Task Cmd Rejected (or Error) Counter

Comments:

Product Var Name iCT_Mode

Is element of: GLA03 Main Record

Short Description: CT Task Mode

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 32768

Description: CT Task mode. Bit 0 indicates CT Task Software Mode; 0=Manual, 1=Auto. Bit 1 indicates CT Task C&T Control Hardware Mode, Register bit; 0=Manual, 1=Auto. Bit 2 indicates CT Task Startup Mode, Discrete cmd; 0=Manual, 1=Auto Power Up Osc/AD. Bit 3 indicates CT Task Startup AD/OSC, Discrete cmd; 0=Primary, 1= Secondary. Bits 4 - 5 indicate CT Etalon Tracking Mode; 0=Off, 1=Acquire, 2=Tracking, 3=Invalid. Bits 6 - 7 are spares.

Comments:

Product Var Name i_phdr_25

Is element of: GLA03 Main Record

Short Description: Primary Header APID 25

Product Data Type: i1b (6, 4)

Total Bytes: 24

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: null
Product Maximum: null
Description: Primary Header APID 25
Comments:

Product Var Name i_shdr_25
Is element of: GLA03 Main Record
Short Description: Secondary Header APID 25 (time stamp)
Product Data Type: i1b (8, 4)
Total Bytes: 32
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: null
Product Maximum: null
Description: Secondary Header APID 25 (time stamp)
Comments:

Product Var Name i_HS_PrevMode
Is element of: GLA03 Main Record
Short Description: HS Processor Previous Mode
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 3
Description: HS Processor Previous Mode; 0=Unknown, 2=PROM, 3=EEPROM
Comments:

Product Var Name i_HS_CurMode
Is element of: GLA03 Main Record
Short Description: HS Processor Current Mode
Product Data Type: i1b (4)
Total Bytes: 4

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 3

Description: HS Processor Current Mode; 0=Unknown, 2=PROM, 3=EEPROM

Comments:

Product Var Name i_SubSysPres

Is element of: GLA03 Main Record

Short Description: Subsystem Present Flags

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 65535

Description: Subsystem Present Bit Flags. Value of 0 = subsystem not present; value of 1 = subsystem present in small and large telemetry packets. Bit 0 = HS; Bit 1 = CS; Bit 2 = TC; Bit 3 = SB; Bit 4 = SM; Bit 5 = RT; Bit 6 = AD; Bit 7 = MD; Bit 8 = CD; Bit 9 = DC; Bit 10 = GP; Bit 11 = PC; Bit 12 = CT. Bits 13-15 are spares.

Comments:

Product Var Name iHS_WarmRCt

Is element of: GLA03 Main Record

Short Description: HS Warm Restart Count

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 32768

Description: HS Warm Restart Count

Comments:

Product Var Name iHS_ColdRCt

Is element of: GLA03 Main Record

Short Description: HS Cold Restart Count
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: HS Cold Restart Count
Comments:

Product Var Name iHS_MxWarmRCt
Is element of: GLA03 Main Record
Short Description: HS Max Warm Restart Count
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: HS Max Warm Restart Count
Comments:

Product Var Name iHS_ColdWarmF
Is element of: GLA03 Main Record
Short Description: HS Cold-Warm Flag
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 65535
Description: HS Cold-Warm Flag
Comments:

Product Var Name iHS_OSResetF
Is element of: GLA03 Main Record
Short Description: HS OS Caused Reset Flag
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 65535
Description: HS OS Caused Reset Flag
Comments:

Product Var Name iHS_OSTickCt
Is element of: GLA03 Main Record
Short Description: HS OS Tick Count
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: HS OS Tick Count
Comments:

Product Var Name iHS_HSExecCt
Is element of: GLA03 Main Record
Short Description: HS HS Exec Count
Product Data Type: i4b (4)
Total Bytes: 16
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 2147483647
Description: HS HS Exec Count

Comments:

Product Var Name iHS_CSExecCt
Is element of: GLA03 Main Record
Short Description: HS CS Exec Count
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: HS CS Exec Count
Comments:

Product Var Name iHS_TCExecCt
Is element of: GLA03 Main Record
Short Description: HS TC Exec Count
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: HS TC Exec Count
Comments:

Product Var Name iHS_SBExecCt
Is element of: GLA03 Main Record
Short Description: HS SB Exec Count
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0

Product Maximum: 32768
Description: HS SB Exec Count
Comments:

Product Var Name iHS_SMExecCt
Is element of: GLA03 Main Record
Short Description: HS SM Exec Count
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: HS SM Exec Count
Comments:

Product Var Name iHS_RTExecCt
Is element of: GLA03 Main Record
Short Description: HS RT Exec Count
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: HS RT Exec Count
Comments:

Product Var Name iHS_MDExecCt
Is element of: GLA03 Main Record
Short Description: HS MD Exec Count
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA

Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: HS MD Exec Count
Comments:

Product Var Name iHS_ADExecCt
Is element of: GLA03 Main Record
Short Description: HS AD Exec Count
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: HS AD Exec Count
Comments:

Product Var Name iHS_CDExecCt
Is element of: GLA03 Main Record
Short Description: HS CD Exec Count
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: HS CD Exec Count
Comments:

Product Var Name iHS_DCExecCt
Is element of: GLA03 Main Record
Short Description: HS DC Exec Count
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts

Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: HS DC Exec Count
Comments:

Product Var Name iHS_GPExecCt
Is element of: GLA03 Main Record
Short Description: HS GP Exec Count
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: HS GP Exec Count
Comments:

Product Var Name iHS_PCExecCt
Is element of: GLA03 Main Record
Short Description: HS PC Exec Count
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: HS PC Exec Count
Comments:

Product Var Name iHS_CTExecCt
Is element of: GLA03 Main Record
Short Description: HS CT Exec Count
Product Data Type: i2b (4)

Total Bytes: 8

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 32768

Description: HS CT Exec Count

Comments:

Product Var Name iHSFPU_Uflw_Ct

Is element of: GLA03 Main Record

Short Description: HS FPU Underflow Count

Product Data Type: i4b (4)

Total Bytes: 16

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: HS FPU Underflow Count

Comments:

Product Var Name iHS_spare1

Is element of: GLA03 Main Record

Short Description: HS spare 1

Product Data Type: i4b (4)

Total Bytes: 16

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: HS spares.

Product Var Name iHS_spare2

Is element of: GLA03 Main Record

Short Description: HS Spare 2

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: HS spares.

Product Var Name iHSTCfireISRCt

Is element of: GLA03 Main Record

Short Description: HS TC Fire Cmd ISR Count

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 32768

Description: HS TC Fire Cmd ISR Count

Comments:

Product Var Name iHS_RTISRCtLo

Is element of: GLA03 Main Record

Short Description: HS RT ISR Count - Low Priority

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 32768

Description: HS RT ISR Count - Low Priority

Comments:

Product Var Name iHS_spare3

Is element of: GLA03 Main Record

Short Description: HS Spare 3

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: HS spares.

Product Var Name iHS_CTISRCt

Is element of: GLA03 Main Record

Short Description: HS CT ISR Count

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 32768

Description: HS CT ISR Count

Comments:

Product Var Name iHS_spare4

Is element of: GLA03 Main Record

Short Description: HS Spare 4

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: HS spare.

Product Var Name iHS_spare5

Is element of: GLA03 Main Record

Short Description: HS Spare 5

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: HS spare.

Product Var Name iHS_ppsISRCt

Is element of: GLA03 Main Record

Short Description: HS GPS 10 Sec ISR Count

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 32768

Description: HS GPS 10 Sec ISR Count

Comments:

Product Var Name iHS_DC_ISRCt

Is element of: GLA03 Main Record

Short Description: HS DC ISR Count

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: HS DC ISR Count
Comments:

Product Var Name iHS_PC_ISRCt
Is element of: GLA03 Main Record
Short Description: HS PC ISR Count
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: HS PC ISR Count
Comments:

Product Var Name iHS_CD_ISRCt
Is element of: GLA03 Main Record
Short Description: HS CD ISR Count
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: HS CD ISR Count
Comments:

Product Var Name iHS_AD_ISRCt
Is element of: GLA03 Main Record
Short Description: HS AD ISR Count
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 32768

Description: HS AD ISR Count

Comments:

Product Var Name iHS_spare6

Is element of: GLA03 Main Record

Short Description: HS Spare 6

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: HS spare.

Product Var Name iHS_OSEventSeq

Is element of: GLA03 Main Record

Short Description: HS OS Event Seq Number

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 32768

Description: HS OS Event Seq Number

Comments:

Product Var Name iHS_PeakCPU

Is element of: GLA03 Main Record

Short Description: HS Peak CPU Utilization

Product Data Type: i1b (4)

Total Bytes: 4
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: HS Peak CPU Utilization
Comments:

Product Var Name iHS_LastCPU
Is element of: GLA03 Main Record
Short Description: HS Last CPU Utilization
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: HS Last CPU Utilization
Comments:

Product Var Name iHSPCI_Bus_st
Is element of: GLA03 Main Record
Short Description: HS OS PCI Bus Target Enable and Interrupt status
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 255
Description: HS OS PCI Bus Target Enable and Interrupt status
Comments:

Product Var Name iHSOS_Plog_st
Is element of: GLA03 Main Record

Short Description: HS OS Performance Log Enable Flag
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 1
Description: HS OS Performance Log Enable Flag
Comments:

Product Var Name iHSOS_Plog_ct
Is element of: GLA03 Main Record
Short Description: HS OS Performance Log Item Count
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 255
Description: HS OS Performance Log Item Count
Comments:

Product Var Name iHS_Plog_stAdd
Is element of: GLA03 Main Record
Short Description: HS OS Performance Log Filter Start Address
Product Data Type: i4b (4)
Total Bytes: 16
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 32000
Description: HS OS Performance Log Filter Start Address
Comments:

Product Var Name iHS_Plog_mask

Is element of: GLA03 Main Record

Short Description: HS OS Performance Log Filter Mask

Product Data Type: i4b (4)

Total Bytes: 16

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32000

Description: HS OS Performance Log Filter Mask

Comments:

Product Var Name i_spare25_2

Is element of: GLA03 Main Record

Short Description: Spare25 2

Product Data Type: i1b (6, 4)

Total Bytes: 24

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name iCS_StatFlag

Is element of: GLA03 Main Record

Short Description: CS Status Flags

Product Data Type: i1b (4)

Total Bytes: 4

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: CS Status Flags. Bits 0-1 indicate CS Enable/Disabled Status; value of 0=Disabled, 1=Enabled. Bits 2-3 indicate CS Code Memory Checksum Status; value of 0=Disabled, 1=Enabled, 2=Disabled and Recomputing, 3=Enabled and Recomputing. Bits 4-5 indicate CS Table Memory Checksum Status; value of 0=Disabled, 1=Enabled, 2=Disabled and Recomputing, 3=Enabled and Recomputing. Bits 6-7 indicate CS EEPROM Checksum status; value of 0=Disabled, 1=Enabled, 2=Disabled and Recomputing, 3=Enabled and Recomputing.

Comments:

Product Var Name iCS_codeErr_ct

Is element of: GLA03 Main Record

Short Description: CS Code Segment Error Count

Product Data Type: i1b (4)

Total Bytes: 4

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 128

Description: CS Code Segment Error Count

Comments:

Product Var Name iCSEPROMerr_ct

Is element of: GLA03 Main Record

Short Description: CS EEPROM Segment Error Count

Product Data Type: i1b (4)

Total Bytes: 4

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 128

Description: CS EEPROM Segment Error Count

Comments:

Product Var Name iCSTblRamerr_ct

Is element of: GLA03 Main Record

Short Description: CS Table Ram Segment Error Count

Product Data Type: i1b (4)

Total Bytes: 4

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: CS Table Ram Segment Error Count
Comments:

Product Var Name iCS_codeErr_ID
Is element of: GLA03 Main Record
Short Description: CS Table ID of last Code Error
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: CS Table ID of last Code Error
Comments:

Product Var Name iCSEPROMerr_ID
Is element of: GLA03 Main Record
Short Description: CS Table ID of last EEPROM Error
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: CS Table ID of last EEPROM Error
Comments:

Product Var Name iCSTblRamErrID
Is element of: GLA03 Main Record
Short Description: CS Table ID of last Table RAM Error
Product Data Type: i2b (4)
Total Bytes: 8

Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: CS Table ID of last Table RAM Error
Comments:

Product Var Name iCS_code_mstrcs
Is element of: GLA03 Main Record
Short Description: CS Code Segment Master Checksum
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: CS Code Segment Master Checksum
Comments:

Product Var Name iCSRam_mstrcs
Is element of: GLA03 Main Record
Short Description: CS Table RAM Master Checksum
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: CS Table RAM Master Checksum
Comments:

Product Var Name iCSEPROMmstrcs
Is element of: GLA03 Main Record
Short Description: CS EEPROM Master Checksum

Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: CS EEPROM Master Checksum
Comments:

Product Var Name iEPROM_bmem_cs
Is element of: GLA03 Main Record
Short Description: CS Checksum of EEPROM Boot Memory
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: CS Checksum of EEPROM Boot Memory
Comments:

Product Var Name iEPROM_mem_cs
Is element of: GLA03 Main Record
Short Description: CS Checksum of EEPROM Memory
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: CS Checksum of EEPROM Memory
Comments:

Product Var Name iPROM_mem_cs

Is element of: GLA03 Main Record

Short Description: CS Checksum of PROM Memory

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 32768

Description: CS Checksum of PROM Memory

Comments:

Product Var Name iCS_spare

Is element of: GLA03 Main Record

Short Description: CS Spare

Product Data Type: i1b (18, 4)

Total Bytes: 72

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: CS Spare - 18 bytes.

Product Var Name iTC_MET_u2

Is element of: GLA03 Main Record

Short Description: TC GLAS MET Upper 2 bytes

Product Data Type: i1b (2, 4)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 255

Description: TC GLAS MET Upper 2 bytes

Comments:

Product Var Name iTC_MET_l4
Is element of: GLA03 Main Record
Short Description: TC GLAS MET Lower 4 bytes
Product Data Type: i1b (4, 4)
Total Bytes: 16
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 255
Description: TC GLAS MET Lower 4 bytes
Comments:

Product Var Name iTC_FcmdInc_u2
Is element of: GLA03 Main Record
Short Description: TC Fire Command Time Increment Upper 2 bytes
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: TC Fire Command Time Increment Upper 2 bytes
Comments:

Product Var Name iTC_FcmdInc_l4
Is element of: GLA03 Main Record
Short Description: TC Fire Command Time Increment Lower 4 bytes
Product Data Type: i4b (4)
Total Bytes: 16
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 157680000

Description: TC Fire Command Time Increment Lower 4 bytes
Comments:

Product Var Name iTCworkMET_sec
Is element of: GLA03 Main Record
Short Description: TC GLAS MET Working Time seconds
Product Data Type: i4b (4)
Total Bytes: 16
Product Units: seconds
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 157680000
Description: TC GLAS MET Working Time seconds
Comments:

Product Var Name iTCworkMET_us
Is element of: GLA03 Main Record
Short Description: TC GLAS MET Working Time microseconds
Product Data Type: i4b (4)
Total Bytes: 16
Product Units: microseconds
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 1000000
Description: TC GLAS MET Working Time micro-seconds
Comments:

Product Var Name i_spare25_3
Is element of: GLA03 Main Record
Short Description: Spare25 3
Product Data Type: i1b (18, 4)
Total Bytes: 72
Product Units: n/a
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: Spare 25 3

Product Var Name i_SB_SndErrCnt

Is element of: GLA03 Main Record

Short Description: SB Send Error Count

Product Data Type: i1b (4)

Total Bytes: 4

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 128

Description: SB Send Error Count

Comments:

Product Var Name i_SB_RcvErrCnt

Is element of: GLA03 Main Record

Short Description: SB Receive Error Count

Product Data Type: i1b (4)

Total Bytes: 4

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 128

Description: SB Receive Error Count

Comments:

Product Var Name i_SB_OSErrCnt

Is element of: GLA03 Main Record

Short Description: SB OS Error Count

Product Data Type: i1b (4)

Total Bytes: 4

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: SB OS Error Count
Comments:

Product Var Name iSB_QFullErrCt
Is element of: GLA03 Main Record
Short Description: SB Queue Full Error Count
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: SB Queue Full Error Count
Comments:

Product Var Name iSB_BOverErrCt
Is element of: GLA03 Main Record
Short Description: SB Buffer overrun Error Count
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: SB Buffer overrun Error Count
Comments:

Product Var Name i_SB_LBO_Strm
Is element of: GLA03 Main Record
Short Description: SB last buffer overrun - Stream Id
Product Data Type: i2b (4)
Total Bytes: 8

Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: SB last buffer overrun - Stream Id
Comments:

Product Var Name i_SB_LBO_Pipe
Is element of: GLA03 Main Record
Short Description: SB last buffer overrun - Pipeline Id
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: SB last buffer overrun - Pipeline Id
Comments:

Product Var Name i_SB_LBO_Task
Is element of: GLA03 Main Record
Short Description: SB last buffer overrun - Sender Task ID
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: SB last buffer overrun - Sender Task ID
Comments:

Product Var Name i_SB_LQF_Strm
Is element of: GLA03 Main Record
Short Description: SB last queue full - Stream Id

Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: SB last queue full - Stream Id
Comments:

Product Var Name i_SB_LQF_Pipe
Is element of: GLA03 Main Record
Short Description: SB last queue full - Pipeline Id
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: SB last queue full - Pipeline Id
Comments:

Product Var Name i_SB_LQF_Task
Is element of: GLA03 Main Record
Short Description: SB last queue full - Sender Task ID
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: SB last queue full - Sender Task ID
Comments:

Product Var Name i_SB_Spare

Is element of: GLA03 Main Record

Short Description: SB Spare

Product Data Type: i1b (8, 4)

Total Bytes: 32

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: SB Spare

Product Var Name iSMRemDumpCopy

Is element of: GLA03 Main Record

Short Description: SM num of remaining copies to be dumped

Product Data Type: i1b (4)

Total Bytes: 4

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 128

Description: SM num of remaining copies to be dumped

Comments:

Product Var Name iSM_Dump_flag

Is element of: GLA03 Main Record

Short Description: SM dump in progress flag

Product Data Type: i1b (4)

Total Bytes: 4

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1

Description: SM tbl/mem dump in progress flag. Value of 0 = false, 1 = true.

Comments:

Product Var Name iSM_TblOps_fg

Is element of: GLA03 Main Record

Short Description: SM table operations flag

Product Data Type: i1b (4)

Total Bytes: 4

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 128

Description: SM table operations flag. Bits 0 - 5 indicate SM Table Session Type; value of 0=None, 5=DUMP_ONLY, 6=REP_EEPROM, 7=REP_RAM, 8=APPD_ACTV. Bit 6 indicates table operations; value of 0 = Inactive, 1 = Active. Bit 7 is spare.

Comments:

Product Var Name iSM_TOp_ImgTyp

Is element of: GLA03 Main Record

Short Description: SM table operations from image type

Product Data Type: i1b (4)

Total Bytes: 4

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 3

Description: SM table operations from image type. Value of 0=None, 1=EEPROM, 2=RAM, 3=NULL.

Comments:

Product Var Name iSM_TblID_sel

Is element of: GLA03 Main Record

Short Description: SM table id selected

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 32768
Description: SM table id selected
Comments:

Product Var Name iSM_TblSize
Is element of: GLA03 Main Record
Short Description: SM currently selected table size in words
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: SM currently selected tbl size in words
Comments:

Product Var Name iSM_TblCksum
Is element of: GLA03 Main Record
Short Description: SM currently selected table checksum
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 65535
Description: SM currently selected table checksum
Comments:

Product Var Name iSM_success_ct
Is element of: GLA03 Main Record
Short Description: SM table commit success count
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA

Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: SM table commit success count
Comments:

Product Var Name iSM_fail_ct
Is element of: GLA03 Main Record
Short Description: SM table commit failure count
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: SM table commit failure count
Comments:

Product Var Name iSM_TblWdLd_ct
Is element of: GLA03 Main Record
Short Description: SM table num. of words loaded
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: SM table num. of words loaded
Comments:

Product Var Name iSM_FSW_BldNum
Is element of: GLA03 Main Record
Short Description: SM FSW build number
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 128

Description: SM FSW build number

Comments:

Product Var Name iSM_FSW_VerNum

Is element of: GLA03 Main Record

Short Description: SM FSW version number

Product Data Type: i1b (4)

Total Bytes: 4

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 128

Description: SM FSW version number

Comments:

Product Var Name iSM_Spares

Is element of: GLA03 Main Record

Short Description: SM spares

Product Data Type: i1b (10, 4)

Total Bytes: 40

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: SM Spare

Product Var Name iBCRT_CntrlRWd

Is element of: GLA03 Main Record

Short Description: BCRT CONTROL REGISTER WORD

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 384

Description: BCRT CONTROL REGISTER WORD. Bit 7 indicates RT Channel A Select; value of 0 = off, 1 = on. Bit 8 indicates RT Channel B Select; value of 0 = off, 1 = on. All other bits are unused.

Comments:

Product Var Name iBCRT_StatReg

Is element of: GLA03 Main Record

Short Description: BCRT Status Register

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 1

Description: BCRT Status Register. Bit 0 indicates RT Status, RT Mode Enabled Flag; value of 0 = Disabled, 1 = Enabled. All other bits are unused.

Comments:

Product Var Name iBCRT_IntStReg

Is element of: GLA03 Main Record

Short Description: BCRT INTERRUPT STATUS REGISTER

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 65535

Description: BCRT INTERRUPT STATUS REGISTER

Comments:

Product Var Name iRT_MsgErr

Is element of: GLA03 Main Record
Short Description: RT 1553 MESSAGE ERRORS
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: RT 1553 MESSAGE ERRORS
Comments:

Product Var Name iRT_RtryCt
Is element of: GLA03 Main Record
Short Description: RT 1553 RETRY COUNT
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: RT 1553 RETRY COUNT
Comments:

Product Var Name iRT_InvCmd
Is element of: GLA03 Main Record
Short Description: RT 1553 INVALID COMMANDS
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: RT 1553 INVALID COMMANDS
Comments:

Product Var Name iRT_InvBCCmd
Is element of: GLA03 Main Record
Short Description: RT 1553 INVALID BROADCAST CMDS
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: RT 1553 INVALID BROADCAST CMDS
Comments:

Product Var Name iRT_ModeCodeCt
Is element of: GLA03 Main Record
Short Description: RT MODE CODES RECEIVED
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: RT MODE CODES RECEIVED
Comments:

Product Var Name i_spare25_4
Is element of: GLA03 Main Record
Short Description: Spare25 4
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: n/a
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name iRT_RcvRCH1_ct

Is element of: GLA03 Main Record

Short Description: RT PACKETS RECEIVED ON RCH1

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 32768

Description: RT PACKETS RECEIVED ON RCH1

Comments:

Product Var Name iRT_RejRCH1_ct

Is element of: GLA03 Main Record

Short Description: RT PACKETS Rejected ON RCH1

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 32768

Description: RT PACKETS Rejected ON RCH1

Comments:

Product Var Name iRT_SentXCH1ct

Is element of: GLA03 Main Record

Short Description: RT PACKETS SENT ON XCH1

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0
Product Maximum: 32768
Description: RT PACKETS SENT ON XCH1; HK channel.
Comments:

Product Var Name iRT_SentXCH2ct
Is element of: GLA03 Main Record
Short Description: RT PACKETS SENT ON XCH2
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: RT PACKETS SENT ON XCH2; Diagnostic channel.
Comments:

Product Var Name iRT_CmdHist_ct
Is element of: GLA03 Main Record
Short Description: RT Number of Command History Packets Sent
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: RT Number of Command History Packets Sent
Comments:

Product Var Name iRT_cksum_st
Is element of: GLA03 Main Record
Short Description: RT Checksum Status
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 1

Description: RT Checksum Status. Value of 0 = CMD Checksum Disabled; 1 = CMD Checksum enabled.

Comments:

Product Var Name i_spare25_5

Is element of: GLA03 Main Record

Short Description: Spare25 5

Product Data Type: i1b (8, 4)

Total Bytes: 32

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name iMD_Tbl_flg

Is element of: GLA03 Main Record

Short Description: MD Table Enable Flag

Product Data Type: i1b (4)

Total Bytes: 4

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description:

Comments:

Product Var Name iMD_spare

Is element of: GLA03 Main Record

Short Description: MD spare

Product Data Type: i1b (4)

Total Bytes: 4

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: MD spare

Product Var Name iMD_T1addct

Is element of: GLA03 Main Record

Short Description: MD Table #1 Address Count

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: Counts

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 32768

Description:

Comments:

Product Var Name iMD_T2addct

Is element of: GLA03 Main Record

Short Description: MD Table #2 Address Count

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 32768

Description:

Comments:

Product Var Name iMD_T1rate

Is element of: GLA03 Main Record

Short Description: MD Table #1 Rate

Product Data Type: i2b (4)
Total Bytes: 8
Product Units: Counts
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description:
Comments:

Product Var Name iMD_T2rate
Is element of: GLA03 Main Record
Short Description: MD Table #2 Rate
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description:
Comments:

Product Var Name iMD_spare2
Is element of: GLA03 Main Record
Short Description: MD Spare 2
Product Data Type: i1b (12, 4)
Total Bytes: 48
Product Units: n/a
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 0
Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.
Comments: MD spare

Product Var Name i_phdr_55

Is element of: GLA03 Main Record
Short Description: Primary Header APID 55
Product Data Type: i1b (6, 4)
Total Bytes: 24
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: null
Product Maximum: null
Description: Primary Header APID 55
Comments:

Product Var Name i_shdr_55
Is element of: GLA03 Main Record
Short Description: Secondary Header 55 (time stamp)
Product Data Type: i1b (8, 4)
Total Bytes: 32
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: null
Product Maximum: null
Description: Secondary Header for APID 55 (time stamp)
Comments:

Product Var Name iAD_SWErr_ct
Is element of: GLA03 Main Record
Short Description: AD Software Error Count
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: AD Software Error Count. Number of software errors detected.
Comments:

Product Var Name iAD_HWErr_ct
Is element of: GLA03 Main Record
Short Description: AD Hardware Error Count
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: AD Hardware Error Count. Number of hardware errors detected.
Comments:

Product Var Name iAD_Shot_ct
Is element of: GLA03 Main Record
Short Description: AD Shot Count Value
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: AD Shot Count Value
Comments:

Product Var Name iAD_ShotCtSkip
Is element of: GLA03 Main Record
Short Description: AD Shot Count Skip Detected
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 1

Description: AD Shot Count Skip Detected flag; 0 = no skip, 1 = skip.

Comments:

Product Var Name iAD_Sync_flag

Is element of: GLA03 Main Record

Short Description: AD Synchronized Flag

Product Data Type: i1b (4)

Total Bytes: 4

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 1

Description: AD Synchronized Flag; 0 = not in sync, 1 = in sync.

Comments:

Product Var Name iAD_spare1

Is element of: GLA03 Main Record

Short Description: AD Spare 1

Product Data Type: i1b (5, 4)

Total Bytes: 20

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name iAD_DSPfire_ct

Is element of: GLA03 Main Record

Short Description: AD DSP Laser Fire Count

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0
Product Maximum: 32768
Description: AD DSP Laser Fire Count. Indicates the number of laser fire commands detected.
Comments:

Product Var Name iADDSPalive_ct
Is element of: GLA03 Main Record
Short Description: AD DSP Alive Count
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: AD DSP Alive Count. Increments once every 75ms when laser fire command fails.
Comments:

Product Var Name iAD_AncPkt_ct
Is element of: GLA03 Main Record
Short Description: AD Ancillary Packets Sent
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: AD Ancillary Packets Sent
Comments:

Product Var Name iAD_EngPkt_ct
Is element of: GLA03 Main Record
Short Description: AD Engineering Packets Sent
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: AD Engineering Packets Sent
Comments:

Product Var Name iAD_SmSci_ct
Is element of: GLA03 Main Record
Short Description: AD Science Small Packets Sent
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: AD Science Small Packets Sent
Comments:

Product Var Name iAD_LgSci_ct
Is element of: GLA03 Main Record
Short Description: AD Science Large Packets Sent
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: AD Science Large Packets Sent
Comments:

Product Var Name iDSPLoadProcCt
Is element of: GLA03 Main Record
Short Description: AD DSP Load Packets Processed Count
Product Data Type: i2b (4)
Total Bytes: 8

Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: AD DSP Load Packets Processed Count
Comments:

Product Var Name iDSPMDump_ct
Is element of: GLA03 Main Record
Short Description: AD DSP Memory Dump Packets Sent
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: AD DSP Memory Dump Packets Sent
Comments:

Product Var Name iADMLoadCmdErr
Is element of: GLA03 Main Record
Short Description: AD Memory Load Command Errors
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: AD Memory Load Command Errors
Comments:

Product Var Name iADMDumpCmdErr
Is element of: GLA03 Main Record
Short Description: AD Memory Dump Command Errors

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 32768

Description: AD Memory Dump Command Errors

Comments:

Product Var Name iDSPcksumRate

Is element of: GLA03 Main Record

Short Description: AD DSP Checksum Rate

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 32768

Description: AD DSP Checksum Rate. Number of 48-bit words checked in each of 3 memory types of DSP memory each shot (40 Hz).

Comments:

Product Var Name iDSPcksumSW_st

Is element of: GLA03 Main Record

Short Description: AD DSP Checksum S/W Enable Status

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 1

Description: AD DSP Checksum S/W Enable Status; 0 = Disable, 1 = Enable.

Comments:

Product Var Name iDSP_cksum_ct

Is element of: GLA03 Main Record
Short Description: AD DSP # of times all of memory has been checksumed
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: AD DSP # of times all of memory has been checksumed
Comments:

Product Var Name iDSP_BScksum_l
Is element of: GLA03 Main Record
Short Description: AD DSP Bootstrap Checksum Lower 16 bits
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: AD DSP Bootstrap Checksum Lower 16 bits
Comments:

Product Var Name iDSPEPROMcs_l
Is element of: GLA03 Main Record
Short Description: AD DSP EPROM Checksum Lower 16 bits
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: AD DSP EPROM Checksum Lower 16 bits
Comments:

Product Var Name iDSPRAMcksum_l
Is element of: GLA03 Main Record
Short Description: AD DSP RAM Checksum Lower 16 bits
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: AD DSP RAM Checksum Lower 16 bits
Comments:

Product Var Name iDSP_BScksum_u
Is element of: GLA03 Main Record
Short Description: AD DSP Bootstrap Checksum Upper 32 bits
Product Data Type: i4b (4)
Total Bytes: 16
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 2147483647
Description: AD DSP Bootstrap Checksum Upper 32 bits
Comments:

Product Var Name iDSPEPROMcs_u
Is element of: GLA03 Main Record
Short Description: AD DSP EPROM Checksum Upper 32 bits
Product Data Type: i4b (4)
Total Bytes: 16
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 2147483647

Description: AD DSP EPROM Checksum Upper 32 bits
Comments:

Product Var Name iDSPRAMcksum_u
Is element of: GLA03 Main Record
Short Description: AD DSP RAM Checksum Upper 32 bits
Product Data Type: i4b (4)
Total Bytes: 16
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 2147483647
Description: AD DSP RAM Checksum Upper 32 bits
Comments:

Product Var Name iAD_DSPsw_bnum
Is element of: GLA03 Main Record
Short Description: AD DSP S/W Build Number
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 255
Description: AD DSP S/W Build Number
Comments:

Product Var Name iAD_DSPsw_vnum
Is element of: GLA03 Main Record
Short Description: AD DSP S/W Version Number
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes

Product Minimum: 0
Product Maximum: 255
Description: AD DSP S/W Version Number
Comments:

Product Var Name iAD_GPSrwin_ct
Is element of: GLA03 Main Record
Short Description: AD GPS Range Window Packets received
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: AD GPS Range Window Packets received
Comments:

Product Var Name iDSP_Pcksuml
Is element of: GLA03 Main Record
Short Description: AS DSP Patch Checksum Bits 15..0
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description:
Comments:

Product Var Name iDSP_Pcksumu
Is element of: GLA03 Main Record
Short Description: AS DSP Patch Checksum bits 47..16
Product Data Type: i4b (4)
Total Bytes: 16
Product Units: n/a
Invalid Value/Flag: No

Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 2147483647
Description:
Comments:

Product Var Name iDSP_autoreset
Is element of: GLA03 Main Record
Short Description: AD Auto Reset DSP Flag
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: n/a
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 255
Description:
Comments:

Product Var Name iAD_SWenable
Is element of: GLA03 Main Record
Short Description: AD Software Enable Flags
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: n/a
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 255
Description:
Comments:

Product Var Name iAD_DSPtroub
Is element of: GLA03 Main Record
Short Description: AD DSP Trouble Indicator Status Word
Product Data Type: i1b (2, 4)
Total Bytes: 8

Product Units: n/a
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 255
Description:
Comments:

Product Var Name iADmemTLoaderr
Is element of: GLA03 Main Record
Short Description: AD DSP Memory Table Load Error Counter
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: n/a
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 255
Description:
Comments:

Product Var Name iAD_FixGain
Is element of: GLA03 Main Record
Short Description: AD Fixed Return Gain Setting
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: n/a
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 255
Description:
Comments:

Product Var Name iAD_spare2
Is element of: GLA03 Main Record
Short Description: AD Spare 2

Product Data Type: i1b (4)

Total Bytes: 4

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name iCD_Swerr_ct

Is element of: GLA03 Main Record

Short Description: CD Software Error Count

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 32768

Description: CD Software Error Count

Comments:

Product Var Name iCD_shot_ct

Is element of: GLA03 Main Record

Short Description: CD Shot Count

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 32768

Description: CD Shot Count

Comments:

Product Var Name iCD_SciPkt_ct

Is element of: GLA03 Main Record
Short Description: CD Science Mode Packets Sent
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: CD Science Mode Packets Sent
Comments:

Product Var Name iCD_EngPkt_ct
Is element of: GLA03 Main Record
Short Description: CD Engineering Mode Packets Sent
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: CD Engineering Mode Packets Sent
Comments:

Product Var Name iCD_AncPkt_ct
Is element of: GLA03 Main Record
Short Description: CD Ancillary Packet Sent
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: CD Ancillary Packet Sent
Comments:

Product Var Name iCDRGateRcv_ct
Is element of: GLA03 Main Record
Short Description: CD Range Gate Pkts Received
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: CD Range Gate Pkts Received
Comments:

Product Var Name iCD40ctrPkt_ct
Is element of: GLA03 Main Record
Short Description: CD 40-bit Counter Packets Sent
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: CD 40-bit Counter Packets Sent
Comments:

Product Var Name i_spare55_1
Is element of: GLA03 Main Record
Short Description: Spare 55_1
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 0

Description: Spare in telemetry.
Comments:

Product Var Name iCD_BG1delay
Is element of: GLA03 Main Record
Short Description: CD Background #1 Delay
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: CD Background #1 Delay
Comments:

Product Var Name iCD_BG2delay
Is element of: GLA03 Main Record
Short Description: CD Background #2 Delay
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: CD Background #2 Delay
Comments:

Product Var Name iCD_Rgatedelay
Is element of: GLA03 Main Record
Short Description: CD Range Gate Delay
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 32768

Description: CD Range Gate Delay

Comments:

Product Var Name i_spare55_2

Is element of: GLA03 Main Record

Short Description: Spare 55_2

Product Data Type: i1b (2, 4)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: Spare in telemetry.

Comments:

Product Var Name iCD_rawADout

Is element of: GLA03 Main Record

Short Description: CD Raw A/D Output Data Structure

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 65535

Description: CD Raw A/D Output Data Structure. Bits 0 - 7 are the raw Cloud digitizer A/D output data. Bit 8 is the CD Raw A/D Overflow Flag. Bits 9 - 13 indicate the CD Attenuation Setting; value of 1=1/1, 2=1/1.77, 4=1/3.16, 8=1/5.6, 16=1/10. All other bits are unused.

Comments:

Product Var Name iCD_GPSLch_32l

Is element of: GLA03 Main Record

Short Description: CD GPS 40 bit Latch Value 32 lsb

Product Data Type: i4b (4)

Total Bytes: 16

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 2147483647
Description: CD GPS 40 bit Latch Value 32 lsb
Comments:

Product Var Name iCDfackLch_32l
Is element of: GLA03 Main Record
Short Description: CD Fire Acknowledge 40 bit Latch Value 32 lsb
Product Data Type: i4b (4)
Total Bytes: 16
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 2147483647
Description: CD Fire Acknowledge 40 bit Latch Value 32 lsb
Comments:

Product Var Name iCDfcmdLch_32l
Is element of: GLA03 Main Record
Short Description: CD Fire Cmd 40 bit Latch Value 32 lsb
Product Data Type: i4b (4)
Total Bytes: 16
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 2147483647
Description: CD Fire Cmd 40 bit Latch Value 32 lsb
Comments:

Product Var Name i_spare55_3
Is element of: GLA03 Main Record
Short Description: Spare 55_3
Product Data Type: i1b (4)

Total Bytes: 4
Product Units: n/a
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 0
Description: Spare in telemetry
Comments:

Product Var Name iCDfcmdLch_8m
Is element of: GLA03 Main Record
Short Description: CD Fire Cmd 40 bit Latch Value 8 msb
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: CD Fire Cmd 40 bit Latch Value 8 msb
Comments:

Product Var Name iCDfackLch_8m
Is element of: GLA03 Main Record
Short Description: CD Fire Acknowledge 40 bit Latch Value 8 msb
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: CD Fire Acknowledge 40 bit Latch Value 8 msb
Comments:

Product Var Name iCD_GPSLch_8m
Is element of: GLA03 Main Record

Short Description: CD GPS 40 bit Latch Value 8 msb
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: CD GPS 40 bit Latch Value 8 msb
Comments:

Product Var Name iCD_dataRdyCtr
Is element of: GLA03 Main Record
Short Description: CD Data Ready Counter
Product Data Type: i4b (4)
Total Bytes: 16
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 65280
Description: CD Data Ready Counter. Bits 8 - 15 are the CD FIRE ACKNOWLEDGE COUNTER.
Comments:

Product Var Name iCD_intsrc
Is element of: GLA03 Main Record
Short Description: CD Software Mode Flag
Product Data Type: i4b (4)
Total Bytes: 16
Product Units: n/a
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 2147483647
Description:
Comments:

Product Var Name iCD_PWaccum
Is element of: GLA03 Main Record
Short Description: CD PW Limit Violation Counter
Product Data Type: i4b (4)
Total Bytes: 16
Product Units: counts
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 2147483647
Description:
Comments:

Product Var Name iCD_PWLong
Is element of: GLA03 Main Record
Short Description: CD Long PW Violation Counter
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 127
Description:
Comments:

Product Var Name iCD_PWshort
Is element of: GLA03 Main Record
Short Description: CD Short PW Violation Counter
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 127
Description:

Comments:

Product Var Name iCD_PWmsb
Is element of: GLA03 Main Record
Short Description: CD Short PW MSB
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 127
Description:
Comments:

Product Var Name i_spare55_4
Is element of: GLA03 Main Record
Short Description: Spare 55_4
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: n/a
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 0
Description: Spare in telemetry
Comments:

Product Var Name iDC_swFailct
Is element of: GLA03 Main Record
Short Description: DC Software Fail Count
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: Counts
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0

Product Maximum: 32768
Description:
Comments:

Product Var Name iDC_shot_ct
Is element of: GLA03 Main Record
Short Description: DC Shot Count
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: DC Shot Count
Comments:

Product Var Name iDC_Xpos
Is element of: GLA03 Main Record
Short Description: DC X Position
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: DC X Position
Comments:

Product Var Name iDC_Ypos
Is element of: GLA03 Main Record
Short Description: DC Y Position
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA

Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: DC Y Position
Comments:

Product Var Name iDC_LPApkt_ct
Is element of: GLA03 Main Record
Short Description: DC LPA Packets Sent
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: DC LPA Packets Sent
Comments:

Product Var Name iDC_tmode_rate
Is element of: GLA03 Main Record
Short Description: DC Test Mode Rate
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: DC Test Mode Rate
Comments:

Product Var Name iDC_pkt_ct
Is element of: GLA03 Main Record
Short Description: DC Packets Sent
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts

Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: DC Packets Sent
Comments:

Product Var Name iDC_byte_ct
Is element of: GLA03 Main Record
Short Description: DC Bytes Sent
Product Data Type: i4b (4)
Total Bytes: 16
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 2147483647
Description: DC Bytes Sent
Comments:

Product Var Name iDC_outbitrate
Is element of: GLA03 Main Record
Short Description: DC Output bit rate in BPS
Product Data Type: i4b (4)
Total Bytes: 16
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 2147483647
Description: DC Output bit rate in BPS
Comments:

Product Var Name iDC_IntReg
Is element of: GLA03 Main Record
Short Description: DC Interrupt register
Product Data Type: i4b (4)

Total Bytes: 16

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: DC Interrupt register

Comments:

Product Var Name iDC_CtlLchReg

Is element of: GLA03 Main Record

Short Description: DC Control latch register

Product Data Type: i4b (4)

Total Bytes: 16

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: DC Control latch register

Comments:

Product Var Name iDC_intMaskReg

Is element of: GLA03 Main Record

Short Description: DC Interrupt Mask Register

Product Data Type: i4b (4)

Total Bytes: 16

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: DC Interrupt Mask Register; indicates which interrupts are enabled/disabled. Bit 0 is the DC Interrupt 1; value of 0 = Disabled, 1 = Enabled. Bit 1 is the DC LPA Interrupt; value of 0 = Disabled, 1 = Enabled. Bit 2 is the DC Output FIFO Empty Interrupt; value of 0 = Disabled, 1 = Enabled. Bit 3 is the DC Output FIFO Full Interrupt; value of 0 = Disabled, 1 = Enabled. Bit 4 is the DC RAM Busy Interrupt; value of 0 = Disabled, 1 = Enabled. Bit 5 is the DC Interrupt 6; value of 0 = Disabled, 1 = Enabled. All other bits are unused.

Comments:

Product Var Name iDC_FIFO_reg

Is element of: GLA03 Main Record

Short Description: DC fifo flags register

Product Data Type: i4b (4)

Total Bytes: 16

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: DC FIFO flags register. Bit 0 is the DC FIFO Fill flag; value of 0 = True, 1 = false. Bit 1 is the DC FIFO almost empty flag; value 0f 0 = True, 1 = false. Bit 2 is the DC FIFO almost full flag; value 0f 0 = True, 1 = false. Bit 3 is the DC FIFO empty flag; value 0f 0 = True, 1 = false. All other bits are unused.

Comments:

Product Var Name IDC_LPAgainReg

Is element of: GLA03 Main Record

Short Description: DC LPA gain register

Product Data Type: i4b (4)

Total Bytes: 16

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: DC LPA gain register. Bits 0-2 are the LPA gain. Bit 3 is the LPA reset flag; value of 0 = In reset, 1 = not in reset.

Comments:

Product Var Name iDC_LPACt_reg

Is element of: GLA03 Main Record

Short Description: DC LPA packet count register

Product Data Type: i4b (4)

Total Bytes: 16

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: DC LPA packet count register. Bits 0 - 13 are the LPA frame byte count. Bits 16 - 23 are the LPA packet (frame) count.

Comments:

Product Var Name iDC_spares

Is element of: GLA03 Main Record

Short Description: DC Spares

Product Data Type: i1b (8, 4)

Total Bytes: 32

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: DC Spares

Product Var Name iGPS10secIntCt

Is element of: GLA03 Main Record

Short Description: GP GPS 10 second Interrupt Count

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 32768

Description: GP GPS 10 second Interrupt Count

Comments:

Product Var Name iGPPosPktRcvCt

Is element of: GLA03 Main Record

Short Description: GP Number of Position Packets received

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: GP Number of Position Packets received
Comments:

Product Var Name iGP_HskPkt_ct
Is element of: GLA03 Main Record
Short Description: GP Number of Housekeeping packets sent
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: GP Number of Housekeeping packets sent
Comments:

Product Var Name iGP_AncPkt_ct
Is element of: GLA03 Main Record
Short Description: GP Number of Ancillary Packets sent
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: GP Number of Ancillary Packets sent
Comments:

Product Var Name iGPS40bitReqCt
Is element of: GLA03 Main Record
Short Description: GP GPS 10 sec Pulse 40-Bit Counter Requests sent
Product Data Type: i2b (4)
Total Bytes: 8

Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: GP GPS 10 sec Pulse 40-Bit Counter Requests sent
Comments:

Product Var Name iGPS40bitRcvCt
Is element of: GLA03 Main Record
Short Description: GP GPS 10 sec Pulse 40-Bit Counter Packets Received
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: GP GPS 10 sec Pulse 40-Bit Counter Packets Received
Comments:

Product Var Name iGP_BadXYZ_cnt
Is element of: GLA03 Main Record
Short Description: GP Packets with bad X,Y,Z Position Data
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: -32768
Product Maximum: 32768
Description: GP Packets with bad X,Y,Z Position Data
Comments:

Product Var Name iGP_TolXYZ_cnt
Is element of: GLA03 Main Record
Short Description: GP Packets with X,Y,Z data below Tolerance

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 32768

Description: GP Packets with X,Y,Z Position Data Below Tolerance

Comments:

Product Var Name iGP_PktsSent

Is element of: GLA03 Main Record

Short Description: GP Number of Range Packets Sent

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 32768

Description: GP Number of Range Packets Sent

Comments:

Product Var Name iGP_spares

Is element of: GLA03 Main Record

Short Description: GP Spares

Product Data Type: i1b (22, 4)

Total Bytes: 88

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: GP Spares

Product Var Name iPC_swerrct

Is element of: GLA03 Main Record
Short Description: PC Software Error Count
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: PC Software Error Count
Comments:

Product Var Name iPC_shot_ct
Is element of: GLA03 Main Record
Short Description: PC Shot Counter
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: Photon counter (PC) Shot Counter
Comments:

Product Var Name iPC_SciPkt_ct
Is element of: GLA03 Main Record
Short Description: PC SCIENCE MODE PACKETS SENT
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: PC SCIENCE MODE PACKETS SENT
Comments:

Product Var Name iPC_EngPkt_ct
Is element of: GLA03 Main Record
Short Description: PC ENGINEERING MODE PACKETS SENT
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: PC ENGINEERING MODE PACKETS SENT
Comments:

Product Var Name iPC_AncPkt_ct
Is element of: GLA03 Main Record
Short Description: PC ANCILLARY MODE PACKETS SENT
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: PC ANCILLARY MODE PACKETS SENT
Comments:

Product Var Name iPC_RDlyRcv_ct
Is element of: GLA03 Main Record
Short Description: PC RANGE GATE DELAY PACKETS RECEIVED
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768

Description: PC RANGE GATE DELAY PACKETS RECEIVED
Comments:

Product Var Name iPC_SPCMDly
Is element of: GLA03 Main Record
Short Description: PC SPCM Gate Delay
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: PC SPCM Gate Delay
Comments:

Product Var Name iPC_BG1Dly
Is element of: GLA03 Main Record
Short Description: PC Background 1 Delay
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: PC Background 1 Delay
Comments:

Product Var Name iPC_BG2Dly
Is element of: GLA03 Main Record
Short Description: PC Background 2 Delay
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 32768

Description: PC Background 2 Delay

Comments:

Product Var Name iPC_RGateDly

Is element of: GLA03 Main Record

Short Description: PC Range Gate Delay

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 32768

Description: PC Range Gate Delay

Comments:

Product Var Name iPC_HW_stat

Is element of: GLA03 Main Record

Short Description: PC Hardware Mode Status Word

Product Data Type: i4b dictate)

Total Bytes: 16

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: PC Hardware Mode Status Word. Bits 0 -2 indicate the PC board hardware mode; a value of 1=Idle, 2=Engineering, 4=Science. Bits 12 - 13 indicate the PC interrupt source; a value of 1=Fire Command, 2=Fire Acknowledge. Bit 14 is the PC measurement source; a value of 0=Fire Command, 1=Fire Acknowledge. All other bits are unused.

Comments:

Product Var Name IPC_SPCM_st

Is element of: GLA03 Main Record

Short Description: PC SPCM STATUS

Product Data Type: i4b (4)

Total Bytes: 16

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: PC SPCM (Single photon counting module) Status. Indicates which of the eight SPCMs are enable/ disabled. A value of 0 = enabled, 1 = disabled. Bit 8 corresponds to SPCM 1. Bit 9 corresponds to SPCM 2. Bit 10 corresponds to SPCM 3. Bit 11 corresponds to SPCM 4. Bit 12 corresponds to SPCM 5. Bit 13 corresponds to SPCM 6. Bit 14 corresponds to SPCM 7. Bit 15 corresponds to SPCM 8. All other bits are unused.

Comments:

Product Var Name iPC_DatRdyCtr

Is element of: GLA03 Main Record

Short Description: PC Data Ready Counter

Product Data Type: i4b (4)

Total Bytes: 16

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 65535

Description: PC Data Ready Counter. Bits 8 - 15 are the PC FIRE ACKNOWLEDGE COUNTER.

Comments:

Product Var Name iPCSPCMraw_1_4

Is element of: GLA03 Main Record

Short Description: PC SPCM 1 THROUGH 4 RAW COUNTS

Product Data Type: i4b (4)

Total Bytes: 16

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: The raw counts for SPCM 1, 2, 3,4. Bits 0-7 correspond to SPCM 1; bits 8 - 15 correspond to SPCM 2; bits 16 - 23 correspond to SPCM 3; bits 24 - 31 correspond to SPCM 4.

Comments:

Product Var Name iPCSPCMraw_5_8

Is element of: GLA03 Main Record

Short Description: PC SPCM 5 THROUGH 8 RAW COUNTS

Product Data Type: i4b (4)

Total Bytes: 16

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: The raw counts for SPCM 5, 6, 7, 8. Bits 0-7 correspond to SPCM 5; bits 8 - 15 correspond to SPCM 6; bits 16 - 23 correspond to SPCM 7; bits 24 - 31 correspond to SPCM 8.

Comments:

Product Var Name iPCSPCM_DCycle

Is element of: GLA03 Main Record

Short Description: PC SPCM Duty Cycle

Product Data Type: i4b (4)

Total Bytes: 16

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: PC SPCM Duty Cycle

Comments:

Product Var Name iPC_spare1

Is element of: GLA03 Main Record

Short Description: PC Spares

Product Data Type: i1b (2, 4)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: PC spare

Product Var Name iC_BSCalXstart
Is element of: GLA03 Main Record
Short Description: PC Coarse Boresite Calibration X Start Pos
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: PC Coarse Boresite Calibration X Start Pos
Comments:

Product Var Name iC_BSCalYstart
Is element of: GLA03 Main Record
Short Description: PC Coarse Boresite Calibration Y Start Pos
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: PC Coarse Boresite Calibration Y Start Pos
Comments:

Product Var Name iF_BSCalXstart
Is element of: GLA03 Main Record
Short Description: PC Fine Boresite Calibration X Start Pos
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0

Product Maximum: 32768
Description: PC Fine Boresite Calibration X Start Pos
Comments:

Product Var Name iF_BSCalYstart
Is element of: GLA03 Main Record
Short Description: PC Fine Boresite Calibration Y Start Pos
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: PC Fine Boresite Calibration Y Start Pos
Comments:

Product Var Name iC_BSCalXinc
Is element of: GLA03 Main Record
Short Description: PC Coarse Boresite Calibration X Increment
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: PC Coarse Boresite Calibration X Increment
Comments:

Product Var Name iC_BSCalYinc
Is element of: GLA03 Main Record
Short Description: PC Coarse Boresite Calibration Y Increment
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA

Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: PC Coarse Boresite Calibration Y Increment
Comments:

Product Var Name iF_BSCalXinc
Is element of: GLA03 Main Record
Short Description: PC Fine Boresite Calibration X Increment
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: PC Fine Boresite Calibration X Increment
Comments:

Product Var Name iF_BSCalYinc
Is element of: GLA03 Main Record
Short Description: PC Fine Boresite Calibration Y Increment
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: PC Fine Boresite Calibration Y Increment
Comments:

Product Var Name iC_BSCalIntSec
Is element of: GLA03 Main Record
Short Description: PC Coarse Boresite Cal Integration Seconds
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: seconds

Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: PC Coarse Boresite Cal Integration Seconds
Comments:

Product Var Name iF_BSCalIntSec
Is element of: GLA03 Main Record
Short Description: PC Fine Boresite Cal Integration Seconds
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: seconds
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: PC Fine Boresite Cal Integration Seconds
Comments:

Product Var Name i_BSCalXbest
Is element of: GLA03 Main Record
Short Description: PC Boresite Calibration Best X Position
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: PC Boresite Calibration Best X Position
Comments:

Product Var Name i_BSCalYbest
Is element of: GLA03 Main Record
Short Description: PC Boresite Calibration Best Y Position
Product Data Type: i2b (4)

Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: PC Boresite Calibration Best Y Position
Comments:

Product Var Name i_BSCal_remSec
Is element of: GLA03 Main Record
Short Description: PC Boresite Cal Seconds Remaining
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: seconds
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32768
Description: PC Boresite Cal Seconds Remaining
Comments:

Product Var Name i_spare55_5
Is element of: GLA03 Main Record
Short Description: Spare 55_5
Product Data Type: i1b (10, 4)
Total Bytes: 40
Product Units: n/a
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 0
Description: Spares in telemetry
Comments:

Product Var Name iCT_state
Is element of: GLA03 Main Record

Short Description: CT State Machine Current State
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 6
Description: CT State Machine Current State
Comments:

Product Var Name iCTCmdEchoErrCt
Is element of: GLA03 Main Record
Short Description: CT COMMAND ECHO ERRORS
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: CT COMMAND ECHO ERRORS
Comments:

Product Var Name i_LMBCmdRcvCt
Is element of: GLA03 Main Record
Short Description: CT LM BOARD CMDS RECEIVED
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: CT LM BOARD CMDS RECEIVED
Comments:

Product Var Name i_TMBCmdRcvCt
Is element of: GLA03 Main Record
Short Description: CT TM BOARD CMDS RECEIVED
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: CT TM BOARD CMDS RECEIVED
Comments:

Product Var Name i_MCBCmdRcvCt
Is element of: GLA03 Main Record
Short Description: CT MC BOARD CMDS RECEIVED
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: CT MC BOARD CMDS RECEIVED
Comments:

Product Var Name i_HKBCmdRcvCt
Is element of: GLA03 Main Record
Short Description: CT HK BOARD CMDS RECEIVED
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: CT HK BOARD CMDS RECEIVED

Comments:

Product Var Name i_HVPSCmdRcvCt
Is element of: GLA03 Main Record
Short Description: CT HVPS Cmds Received
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: CT HVPS Cmds Received
Comments:

Product Var Name i_PDUCmdRcvCt
Is element of: GLA03 Main Record
Short Description: CT PDU Cmds Received
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: CT PDU Cmds Received
Comments:

Product Var Name i_HWtlm1Pkt_ct
Is element of: GLA03 Main Record
Short Description: CT HW TLM 1 PACKETS SENT
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0

Product Maximum: 128
Description: CT HW TLM 1 PACKETS SENT
Comments:

Product Var Name i_HWtlm2Pkt_ct
Is element of: GLA03 Main Record
Short Description: CT HW TLM 2 PACKETS SENT
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: CT HW TLM 2 PACKETS SENT
Comments:

Product Var Name i_HWtlm3Pkt_ct
Is element of: GLA03 Main Record
Short Description: CT HW TLM 3 PACKETS SENT
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: CT HW TLM 3 PACKETS SENT
Comments:

Product Var Name i_HWtlm4Pkt_ct
Is element of: GLA03 Main Record
Short Description: CT HW TLM 4 PACKETS SENT
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA

Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: CT HW TLM 4 PACKETS SENT
Comments:

Product Var Name i_HWtlm5Pkt_ct
Is element of: GLA03 Main Record
Short Description: CT HW TLM 5 PACKETS SENT
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: CT HW TLM 5 PACKETS SENT
Comments:

Product Var Name iCtdwellPkt_ct
Is element of: GLA03 Main Record
Short Description: CT DWELL PACKETS SENT
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: CT DWELL PACKETS SENT
Comments:

Product Var Name iCT_AncPkt_ct
Is element of: GLA03 Main Record
Short Description: CT ANCILLARY PACKETS SENT
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts

Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: CT ANCILLARY PACKETS SENT
Comments:

Product Var Name iCT_timeout_ct
Is element of: GLA03 Main Record
Short Description: CT TIMEOUT COUNT
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: CT TIMEOUT COUNT
Comments:

Product Var Name iCT_int_ct
Is element of: GLA03 Main Record
Short Description: CT INTERRUPT COUNT
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: CT INTERRUPT COUNT
Comments:

Product Var Name iCT_ShotCtErr
Is element of: GLA03 Main Record
Short Description: CT Shot Counter Errors
Product Data Type: i1b (4)

Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: CT Shot Counter Errors
Comments:

Product Var Name iCT_dwell_mode
Is element of: GLA03 Main Record
Short Description: CT Dwell Mode
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 32
Description: CT Dwell Mode
Comments:

Product Var Name iCT_dwell_chnl
Is element of: GLA03 Main Record
Short Description: CT Dwell Channel
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: CT Dwell Channel
Comments:

Product Var Name iCTLMBmuxErrCt
Is element of: GLA03 Main Record

Short Description: CT Laser Monitor Board Mux Error Counter
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: CT Laser Monitor Board Mux Error Counter
Comments:

Product Var Name iCTHKBmuxErrCt
Is element of: GLA03 Main Record
Short Description: CT Housekeeping Board Mux Error Counter
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: CT Housekeeping Board Mux Error Counter
Comments:

Product Var Name iCTHKBsmxErrCt
Is element of: GLA03 Main Record
Short Description: CT Housekeeping Board Submux Error Counter
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: CT Housekeeping Board Submux Error Counter
Comments:

Product Var Name iCTTCBmuxErrCt
Is element of: GLA03 Main Record
Short Description: CT Temperature Controller Board Mux Error Counter
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: CT Temperature Controller Board Mux Error Counter
Comments:

Product Var Name iCTMCBmuxErrCt
Is element of: GLA03 Main Record
Short Description: CT Mechanism Controller Board Mux Error Counter
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: CT Mechanism Controller Board Mux Error Counter
Comments:

Product Var Name iCTHVPSmuxErrCt
Is element of: GLA03 Main Record
Short Description: CT High Voltage Power Supply Mux Error Counter
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: CT High Voltage Power Supply Mux Error Counter

Comments:

Product Var Name iCTPDUmuxErrCt
Is element of: GLA03 Main Record
Short Description: CT Power Distribution Unit Mux Error Counter
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: CT Power Distribution Unit Mux Error Counter
Comments:

Product Var Name iCT_CEchoSucCt
Is element of: GLA03 Main Record
Short Description: CT Command Echo Success Count
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description: CT Command Echo Success Count
Comments:

Product Var Name iCT_SupErrflag
Is element of: GLA03 Main Record
Short Description: CT Suppressed Event Message Error Flags
Product Data Type: i2b (4)
Total Bytes: 8
Product Units: n/a
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0

Product Maximum: 32768
Description:
Comments:

Product Var Name iCT_LHP1tcstat
Is element of: GLA03 Main Record
Short Description: CT LHP1 Temperature Control State
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: n/a
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description:
Comments:

Product Var Name iCT_LHP2tcstat
Is element of: GLA03 Main Record
Short Description: CT LHP2 Temperature Control State
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: n/a
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description:
Comments:

Product Var Name iCT_LHP1tsp
Is element of: GLA03 Main Record
Short Description: CT LHP1 Temperature Setpoint
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: n/a
Invalid Value/Flag: No
Is Correction Flag?: NA

Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description:
Comments:

Product Var Name iCT_LHP2tsp
Is element of: GLA03 Main Record
Short Description: CT LHP2 Temperature Setpoint
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: n/a
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description:
Comments:

Product Var Name iCT_LHP1tcctr
Is element of: GLA03 Main Record
Short Description: CT LHP1 Temperature Control Counter
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: n/a
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description:
Comments:

Product Var Name iCT_LHP2tcctr
Is element of: GLA03 Main Record
Short Description: CT LHP2 Temperature Control Counter
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: n/a

Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description:
Comments:

Product Var Name iCT_LHP1_Tmin
Is element of: GLA03 Main Record
Short Description: CT LHP1 Minimum Temperature
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: n/a
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description:
Comments:

Product Var Name iCT_LHP2_Tmin
Is element of: GLA03 Main Record
Short Description: CT LHP2 Minimum Temperature
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: n/a
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description:
Comments:

Product Var Name iCT_LHP1_Tdelta
Is element of: GLA03 Main Record
Short Description: CT LHP1 Temperature Change
Product Data Type: i1b (4)

Total Bytes: 4
Product Units: n/a
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description:
Comments:

Product Var Name iCT_LHP2_Tdelta
Is element of: GLA03 Main Record
Short Description: CT LHP2 Temperature Change
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: n/a
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description:
Comments:

Product Var Name iCT_LHP1_Tcyct
Is element of: GLA03 Main Record
Short Description: CT LHP1 Temperature Control Cycle Time
Product Data Type: i1b (4)
Total Bytes: 4
Product Units: n/a
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 128
Description:
Comments:

Product Var Name iCT_LHP2_Tcyct
Is element of: GLA03 Main Record

Short Description: CT LHP2 Temperature Control Cycle Time

Product Data Type: i1b (4)

Total Bytes: 4

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 128

Description:

Comments:

Product Var Name iCT_miscFlag

Is element of: GLA03 Main Record

Short Description: CT Misc Status Flags

Product Data Type: i1b (4)

Total Bytes: 4

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 128

Description:

Comments:

Product Var Name ICT_spares

Is element of: GLA03 Main Record

Short Description: CT Spares

Product Data Type: i1b (11, 4)

Total Bytes: 44

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: CT Spares

Product Var Name i_phdr_ad
Is element of: GLA03 Main Record
Short Description: Primary Header APID 12 or 13
Product Data Type: i1b (6, 64)
Total Bytes: 384
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: null
Product Maximum: null
Description: Primary Header APID 12 or 13
Comments:

Product Var Name i_shdr_ad
Is element of: GLA03 Main Record
Short Description: Secondary Header 12 or 13 (time stamp)
Product Data Type: i1b (8, 64)
Total Bytes: 512
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: null
Product Maximum: null
Description: Secondary Header 12 or 13 (time stamp)
Comments:

Product Var Name i_phdr_15
Is element of: GLA03 Main Record
Short Description: Primary Header APID 15
Product Data Type: i1b (6, 16)
Total Bytes: 96
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: null
Product Maximum: null
Description: Primary Header APID 15

Comments:

Product Var Name i_shdr_15
Is element of: GLA03 Main Record
Short Description: Secondary Header APID 15 (time stamp)
Product Data Type: i1b (8, 16)
Total Bytes: 128
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: null
Product Maximum: null
Description: Secondary Header APID 15 (time stamp)
Comments:

Product Var Name i_phdr_17
Is element of: GLA03 Main Record
Short Description: Primary Header APID 17
Product Data Type: i1b (6, 16)
Total Bytes: 96
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: null
Product Maximum: null
Description: Primary Header APID 17
Comments:

Product Var Name i_shdr_17
Is element of: GLA03 Main Record
Short Description: Secondary Header APID 17 (time stamp)
Product Data Type: i1b (8, 16)
Total Bytes: 128
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: null

Product Maximum: null
Description: Secondary Header APID 17 (time stamp)
Comments:

Product Var Name i_phdr_19
Is element of: GLA03 Main Record
Short Description: Primary Header APID 19
Product Data Type: i1b (6, 16)
Total Bytes: 96
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: null
Product Maximum: null
Description: Primary Header APID 19
Comments:

Product Var Name i_shdr_19
Is element of: GLA03 Main Record
Short Description: Secondary Header APID 19 (time stamp)
Product Data Type: i1b (8, 16)
Total Bytes: 128
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: null
Product Maximum: null
Description: Secondary Header APID 19 (time stamp)
Comments:

Product Var Name i_sctr_19
Is element of: GLA03 Main Record
Short Description: Shot Counter APID 19
Product Data Type: i2b (16)
Total Bytes: 32
Product Units: counts
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 65535

Description: Shot Counter APID 19

Comments:

Product Var Name i_chin_flag

Is element of: GLA03 Main Record

Short Description: Check-In Flags, Mask 0x1F

Product Data Type: i1b (16)

Total Bytes: 16

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: null

Product Maximum: null

Description: The Check-in Flag indicates what telemetry tasks are represented in the current ancillary science packet: AD Task, Mask = 0x01; PC Task, Mask = 0x02; CD Task, Mask = 0x04; GP Task, Mask = 0x08; CT Task, Mask = 0x10; Bit value of 1=task tlm in ancillary pkt, 0=task tlm NOT in ancillary pkt. Dimensioned to 16 because occurs once per second.

Comments:

Product Var Name i_RMS_loc

Is element of: GLA03 Main Record

Short Description: RMS Noise Calculation Location

Product Data Type: i4b (16)

Total Bytes: 64

Product Units: ns

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: Location of RMS noise calculation: starting digitizer element number. RMS location start time. DSP tlm. Dimensioned to 16 because occurs once per second.

Comments:

Product Var Name i_sctrPDlyWF

Is element of: GLA03 Main Record

Short Description: Shot Counter for Post Delay WF

Product Data Type: i4b (16)

Total Bytes: 64

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 255

Description: Shot counter for the Post delay pulse waveform. Dimensioned to 16 because occurs once per second.

Comments:

Product Var Name i_dlaywf_start

Is element of: GLA03 Main Record

Short Description: Post Delay Pulse Waveform Start Address

Product Data Type: i4b (16)

Total Bytes: 64

Product Units: ns

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: Start address of the Post delay laser pulse waveform in nanosecond resolution relative to the first sample of the waveform. Dimensioned to 16 because occurs once per second.

Comments:

Product Var Name i_PDlyWf

Is element of: GLA03 Main Record

Short Description: Sampled Post Delay Pulse Waveform

Product Data Type: i1b (32, 16)

Total Bytes: 512

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: Sampled post delay pulse waveform. Note: offset for this data is from the transmit pulse peak. Dimensioned to 32 by 16 because 32 samples occur once per second.

Comments:

Product Var Name i_otswf_start

Is element of: GLA03 Main Record

Short Description: OTS Pulse Waveform Start Address

Product Data Type: i4b (16)

Total Bytes: 64

Product Units: ns

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: Start address of the following four Optical Test System (OTS) laser pulse waveforms in nanosecond resolution relative to the first sample of the waveform. Dimensioned to 16 because occurs once per second.

Comments:

Product Var Name i_sctrOTSWf

Is element of: GLA03 Main Record

Short Description: Shot Counter for OTS WF

Product Data Type: i4b (4, 16)

Total Bytes: 256

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 65535

Description: Shot counters for the OTS pulse waveforms. Dimensioned to 4 by 16 because 4 OTS waveforms occur each second.

Comments:

Product Var Name i_OTSPWf

Is element of: GLA03 Main Record

Short Description: Sampled OTS Pulse Waveform

Product Data Type: i1b (128, 16)

Total Bytes: 2048

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: Sampled OTS pulse waveform. Note: offset for this data is from the laser fire. Dimensioned to 32 by 64 because 32 samples occur 4 times per second.

Comments:

Product Var Name i_cTx_win_loc

Is element of: GLA03 Main Record

Short Description: Commanded Location of Transmit Pulse Search Window

Product Data Type: i4b (16)

Total Bytes: 64

Product Units: ns

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: Reflects commanded value. Dimensioned to 16 because occurs once per second.

Comments:

Product Var Name i_cNumNoTxing

Is element of: GLA03 Main Record

Short Description: Commanded Number of No Threshold Crossings

Product Data Type: i4b (16)

Total Bytes: 64

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: Number of no threshold crossing shots for error condition. Reflects commanded value. Dimensioned to 16 because occurs once per second.

Comments:

Product Var Name i_spare19_1

Is element of: GLA03 Main Record

Short Description: Spare APID19 1

Product Data Type: i1b (16)

Total Bytes: 16

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: Spare byte from telemetry packet. Dimensioned to 16 because occurs once per second.

Product Var Name i_cTxThresh

Is element of: GLA03 Main Record

Short Description: Commanded Transmit Pulse Threshold Value

Product Data Type: i2b (16)

Total Bytes: 32

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 200

Description: Reflects commanded value. Dimensioned to 16 because occurs once per second.

Comments:

Product Var Name i_cRwinSf

Is element of: GLA03 Main Record

Short Description: Commanded Range Window Weighting Scale Factors

Product Data Type: i4b (24, 16)

Total Bytes: 1536

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 200

Description: Reflects commanded value. Dimensioned to 24 by 16 because 4 scale factors per each filter (6) occurs each second.

Comments:

Product Var Name i_cBgCoeff

Is element of: GLA03 Main Record

Short Description: Commanded Background Coefficients

Product Data Type: i4b (18, 16)

Total Bytes: 1152

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 200

Description: Reflects commanded value. Background noise coefficients A1, A2, A3 for the 4ns, 8ns, 16ns, 32ns, 64ns, and 128ns filter. Dimensioned 3 by 6 by 16 because 3 coefficients occur for the filter per second.

Comments:

Product Var Name i_spare19_2

Is element of: GLA03 Main Record

Short Description: Spare APID19 2

Product Data Type: i1b (16)

Total Bytes: 16

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: Spare in the telemetry. Dimensioned to 16 because occurs once per second.

Product Var Name i_cEnAGC

Is element of: GLA03 Main Record

Short Description: Commanded Enable/Disable AGC

Product Data Type: i1b (16)

Total Bytes: 16

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1

Description: Enable/Disable Auto Gain Calculation. Reflects commanded value. Dimensioned to 16 because occurs once per second.

Comments:

Product Var Name i_cEnAGC_4

Is element of: GLA03 Main Record

Short Description: Commanded Enable/Disable Use 4ns Filter for AGC

Product Data Type: i1b (16)

Total Bytes: 16

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1

Description: Enable/Disable Use 4ns Filter for AGC. Reflects commanded value. Dimensioned to 16 because occurs once per second.

Comments:

Product Var Name i_cRetGn

Is element of: GLA03 Main Record

Short Description: Commanded Return Gain Value

Product Data Type: i1b (16)

Total Bytes: 16

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 200

Description: Return Gain Value. Reflects commanded value. Dimensioned to 16 because occurs once per second.

Comments:

Product Var Name i_cAGC_A

Is element of: GLA03 Main Record

Short Description: Commanded AGC A Parameter

Product Data Type: i4b (4, 16)

Total Bytes: 256

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 200

Description: AGC A Parameters. Reflects commanded value. Dimensioned to 4 by 16 because 4 parameters occur per second.

Comments:

Product Var Name i_cAGC_B

Is element of: GLA03 Main Record

Short Description: Commanded AGC B Parameter

Product Data Type: i4b (4, 16)

Total Bytes: 256

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 200

Description: AGC B Parameters. Reflects commanded value. Dimensioned to 4 by 16 because 4 parameters occur per second.

Comments:

Product Var Name i_cAGC_C

Is element of: GLA03 Main Record

Short Description: Commanded AGC C Parameter

Product Data Type: i4b (2, 16)

Total Bytes: 128

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 200

Description: AGC C0 and C1 Parameters. Reflects commanded value. Dimensioned to 2 by 16 because 2 parameters occur per second.

Comments:

Product Var Name i_cAGC_Gmax

Is element of: GLA03 Main Record

Short Description: Commanded AGC Gmax Parameter

Product Data Type: i1b (16)

Total Bytes: 16

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 100

Description: AGC Gmax Parameter. Reflects commanded value. Dimensioned to 16 because occurs once per second.

Comments:

Product Var Name i_cAGC_Gmin

Is element of: GLA03 Main Record

Short Description: Commanded AGC Gmin Parameter

Product Data Type: i1b (16)

Total Bytes: 16

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 100

Description: AGC Gmin Parameter. Reflects commanded value. Dimensioned to 16 because occurs once per second.

Comments:

Product Var Name i_cAGC_Ginit

Is element of: GLA03 Main Record

Short Description: Commanded AGC Ginit Parameter

Product Data Type: i1b (16)

Total Bytes: 16

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 100

Description: AGC Ginit Parameter. Reflects commanded value. Dimensioned to 16 because occurs once per second.

Comments:

Product Var Name i_cAGC_Zmax

Is element of: GLA03 Main Record

Short Description: Commanded AGC Zmax Parameter

Product Data Type: i4b (16)

Total Bytes: 64

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 200

Description: AGC Zmax Parameter. Reflects commanded value. Dimensioned to 16 because occurs once per second.

Comments:

Product Var Name i_cAGC_Zmin

Is element of: GLA03 Main Record

Short Description: Commanded AGC Zmin Parameter

Product Data Type: i4b (16)

Total Bytes: 64

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 200

Description: AGC Zmin Parameter. Reflects commanded value. Dimensioned to 16 because occurs once per second.

Comments:

Product Var Name i_cAGC_Vref

Is element of: GLA03 Main Record

Short Description: Commanded AGC Vref Parameter

Product Data Type: i4b (16)

Total Bytes: 64

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 200

Description: AGC Vref Parameter. Reflects commanded value. Dimensioned to 16 because occurs once per second.

Comments:

Product Var Name i_cAGC_Vmin

Is element of: GLA03 Main Record

Short Description: Commanded AGC Vmin Parameter

Product Data Type: i1b (16)

Total Bytes: 16

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 200

Description: AGC Vmin Parameter. Reflects commanded value. Dimensioned to 16 because occurs once per second.

Comments:

Product Var Name i_cFiltCTol

Is element of: GLA03 Main Record

Short Description: Commanded Filter Coincidence Tolerance

Product Data Type: i4b (16)

Total Bytes: 64

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 200

Description: Tolerance for coincidence of all filters. Reflects commanded value. Dimensioned to 16 because occurs once per second.

Comments:

Product Var Name i_cRwinDOff

Is element of: GLA03 Main Record

Short Description: Commanded Range Window Dump Offsets

Product Data Type: i4b (6, 16)

Total Bytes: 384

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 200

Description: Range Window Dump Offsets. Offsets applied to trailing edge of range pulse for the selection of the 1000 sample region to be downlinked. Each filter is given a separate offset. Index 0 => 4 nanosecond filter, Index 1 => 8 nanosecond filter, Index 2 => 16 nanosecond filter, Index 3 => 32 nanosecond filter, Index 4 => 64 nanosecond filter and Index 5 => 128 nanosecond filter. Reflects commanded value. Dimensioned to 6 by 16 because offset occurs for each filter (6) per second.

Comments:

Product Var Name i_cRetFThr

Is element of: GLA03 Main Record

Short Description: Commanded Return Pulse Filter Threshold Values

Product Data Type: i1b (6, 16)

Total Bytes: 96

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 200

Description: Reflects commanded value. The return pulse threshold values for all filters. Dimensioned to 6 by 16 because occurs for each filter (6) per second.

Comments:

Product Var Name i_spare_tlm21

Is element of: GLA03 Main Record

Short Description: Spare 21

Product Data Type: i1b (2, 16)

Total Bytes: 32

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_cFIRCoeff

Is element of: GLA03 Main Record

Short Description: Commanded FIR Coefficients

Product Data Type: i1b (8, 16)

Total Bytes: 128

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 200

Description: FIR COEFFICIENTS ? aabb ccdd xxyy zzww; set of eight 8-bit coefficients used by the FIR Filter engine for all filtering conditions. Aabb ccdd ? First set of coefficients. Xxyy zzww? Second set of coefficients. Reflects commanded value. Dimensioned to 8 by 16 because 8 coefficients occur per second.

Comments:

Product Var Name i_FWminStDev

Is element of: GLA03 Main Record

Short Description: Filter Weight Minimum Standard Deviation

Product Data Type: i4b (16)

Total Bytes: 64

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: Filter weight minimum standard deviation.

Comments:

Product Var Name i_FNzMinThr

Is element of: GLA03 Main Record

Short Description: Filter Noise Minimum Thresholds for each Filter

Product Data Type: i4b (6, 16)

Total Bytes: 384

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: Filter Noise Minimum Thresholds for each Filter (4ns, 8ns, 16 ns, 32 ns, 64 ns, 128ns).

Comments:

Product Var Name i_FRejMskLead

Is element of: GLA03 Main Record
Short Description: Filter reject mask for leading edge
Product Data Type: i4b (16)
Total Bytes: 64
Product Units: n/a
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 0
Description:
Comments:

Product Var Name i_FRejMskTrail
Is element of: GLA03 Main Record
Short Description: Filter reject mask for trailing edge
Product Data Type: i4b (16)
Total Bytes: 64
Product Units: n/a
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 0
Description:
Comments:

Product Var Name i_spare19_3
Is element of: GLA03 Main Record
Short Description: Spare APID19 3
Product Data Type: i1b (22, 16)
Total Bytes: 352
Product Units: n/a
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 0
Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.
Comments: Spares in the telemetry. Dimensioned to 22 by 16 because 22 bytes occur per second.

Product Var Name i_shotctr_40

Is element of: GLA03 Main Record

Short Description: Shot Counter

Product Data Type: i2b (40, 16)

Total Bytes: 1280

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 1

Product Maximum: 200

Description:

Comments:

Product Var Name i_fack_time

Is element of: GLA03 Main Record

Short Description: Fire Acknowledge Time

Product Data Type: i1b (200, 16)

Total Bytes: 3200

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 128

Description: Fire Acknowledge Time (from Freq and Time Bd). Freq & Time Board Tlm, 40 bit counter. Dimensioned (5,40,16).

Comments:

Product Var Name i_fcmd_time

Is element of: GLA03 Main Record

Short Description: Fire Command Time

Product Data Type: i1b (200, 16)

Total Bytes: 3200

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 128

Description: Fire Command Time (from Freq and Time Bd). Freq & Time Board Tlm, 40 bit counter. Dimensioned (5,40,16).

Comments:

Product Var Name i_calcSClat

Is element of: GLA03 Main Record

Short Description: Latitude

Product Data Type: i2b (16)

Total Bytes: 32

Product Units: Degrees

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -90

Product Maximum: 90

Description: S/C latitude calculated from s/c position data in degrees. Dimensioned to 16 because occurs once per second.

Comments:

Product Var Name i_calcSClon

Is element of: GLA03 Main Record

Short Description: Longitude

Product Data Type: i2b (16)

Total Bytes: 32

Product Units: Degrees

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 360

Description: S/C longitude calculated from s/c position data in degrees. Dimensioned to 16 because occurs once per second.

Comments:

Product Var Name i_Hsat

Is element of: GLA03 Main Record

Short Description: Height (Hsat)

Product Data Type: i4b (16)

Total Bytes: 64

Product Units: meters

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 800000

Description: S/C geodetic altitude of s/c above earth's surface in kilometers. Dimensioned to 16 because occurs once per second.

Comments:

Product Var Name i_Rsat

Is element of: GLA03 Main Record

Short Description: Rsat

Product Data Type: i4b (16)

Total Bytes: 64

Product Units: meters

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 800000

Description: Distance from s/c to center of earth in kilometers. Dimensioned to 16 because occurs once per second.

Comments:

Product Var Name i_Rmin

Is element of: GLA03 Main Record

Short Description: Rmin

Product Data Type: i4b (16)

Total Bytes: 64

Product Units: meters

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 800000

Description: Range window start in kilometers. Dimensioned to 16 because occurs once per second.

Comments:

Product Var Name i_Rmax

Is element of: GLA03 Main Record

Short Description: Rmax

Product Data Type: i4b (16)

Total Bytes: 64
Product Units: meters
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 800000
Description: Range window stop in kilometers. Dimensioned to 16 because occurs once per second.
Comments:

Product Var Name i_Wmin
Is element of: GLA03 Main Record
Short Description: Wmin
Product Data Type: i4b (16)
Total Bytes: 64
Product Units: meters
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 100000
Description: Minimum window size. Default is 2km. Dimensioned to 16 because occurs once per second.
Comments:

Product Var Name i_Wmax
Is element of: GLA03 Main Record
Short Description: Wmax
Product Data Type: i4b (16)
Total Bytes: 64
Product Units: meters
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 100000
Description: Maximum window size. Default is 11km. Dimensioned to 16 because occurs once per second.
Comments:

Product Var Name i_Hoffmin
Is element of: GLA03 Main Record

Short Description: Hoffmin (DEM uncertainty + bias)

Product Data Type: i4b (16)

Total Bytes: 64

Product Units: meters

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -1000

Product Maximum: 10000

Description: Offset associated with the minimum height. Default is 1.125km. Dimensioned to 16 because occurs once per second.

Comments:

Product Var Name i_Hoffmax

Is element of: GLA03 Main Record

Short Description: Hoffmax (DEM uncertainty - bias)

Product Data Type: i4b (16)

Total Bytes: 64

Product Units: meters

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -2000

Product Maximum: 10000

Description: Offset associated with the maximum height. Default is negative 0.875km. Dimensioned to 16 because occurs once per second.

Comments:

Product Var Name i_Rbmin

Is element of: GLA03 Main Record

Short Description: Rbmin

Product Data Type: i4b (16)

Total Bytes: 64

Product Units: meters

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -1000

Product Maximum: 10000

Description: Bias added to the minimum range for Altimeter Digitizer (in kilometers). Default is 0. Dimensioned to 16 because occurs once per second.

Comments:

Product Var Name i_Rbmax

Is element of: GLA03 Main Record

Short Description: Rbmax

Product Data Type: i4b (16)

Total Bytes: 64

Product Units: meters

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -2000

Product Maximum: 10000

Description: Bias added to the maximum range for Altimeter Digitizer (in kilometers). Default is 0. Dimensioned to 16 because occurs once per second.

Comments:

Product Var Name i_ObSurfType

Is element of: GLA03 Main Record

Short Description: Surface Type

Product Data Type: i1b (16)

Total Bytes: 16

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 3

Description: Surface type from telemetry data: 0=ocean & no ice; 1=land & no ice; 2=ocean & ice; 3=land & ice. Dimensioned to 16 because occurs once per second.

Comments:

Product Var Name i_PosDatFlg

Is element of: GLA03 Main Record

Short Description: Position data valid flag

Product Data Type: i1b (16)

Total Bytes: 16

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: Set to zero(0) if no errors detected during position data processing, otherwise non-zero. Dimensioned to 16 because occurs once per second.

Comments:

Product Var Name i_SCPosPkt

Is element of: GLA03 Main Record

Short Description: Spacecraft Time and Position Packet

Product Data Type: i1b (40, 16)

Total Bytes: 640

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: Spacecraft position and GPS Time command packet received over 1553 bus minus 8 byte CCSDS command header. Format is defined in spacecraft ICD.

Comments:

Product Var Name i_SCPosPktShot

Is element of: GLA03 Main Record

Short Description: Shot Count for 1553 Spacecraft Time and Position Packet

Product Data Type: i2b (16)

Total Bytes: 32

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 255

Description: Shot count captured by RT task when it receives spacecraft position and command packet. Only lower 8 bits valid

Comments:

Product Var Name i_SCPosPktGMET

Is element of: GLA03 Main Record

Short Description: GLAS MET for 1553 Spacecraft Time and Position Packet

Product Data Type: i1b (6, 16)

Total Bytes: 96

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: GLAS MET captured by RT task when it receives spacecraft position and command packet.

Comments:

Product Var Name i_DEMmin

Is element of: GLA03 Main Record

Short Description: DEM minimum byte

Product Data Type: i1b (16)

Total Bytes: 16

Product Units: meters

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: DEM minimum elevation byte used to calculate hmin. Dimensioned to 16 because occurs once per second.

Comments:

Product Var Name i_DEMmax

Is element of: GLA03 Main Record

Short Description: DEM maximum byte

Product Data Type: i1b (16)

Total Bytes: 16

Product Units: meters

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: DEM maximum elevation byte used to calculate hmax. Dimensioned to 16 because occurs once per second.

Comments:

Product Var Name i_RngDatSrc

Is element of: GLA03 Main Record

Short Description: Range data source

Product Data Type: i1b (16)

Total Bytes: 16

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 2

Description: Source of range data: 0=s/c time & pos pkt; 1=uplinked DEM bytes; 2=uplinked Rmin/Rmax. Dimensioned to 16 because occurs once per second.

Comments:

Product Var Name i_FTLatch

Is element of: GLA03 Main Record

Short Description: GPS 10 Sec Pulse 40 bit count value

Product Data Type: i1b (5, 16)

Total Bytes: 80

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 255

Description: Last 40-bit count value from frequency & time board. Corresponds to the last GPS 10 second pulse. Dimensioned to 16 because the latch time occurs once per second. 2 4-byte items because the latch value is 40 bits. The upper 24 bits are not used.

Comments:

Product Var Name i_GPSppsGMET

Is element of: GLA03 Main Record

Short Description: GLAS MET for GPS 0.1 Hz Pulse

Product Data Type: i1b (6, 16)

Total Bytes: 96

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 255

Description: GLAS MET at time of last GPS 10 sec pulse (in VTCW format)

Comments:

Product Var Name i_spare19_4

Is element of: GLA03 Main Record

Short Description: Spare APID 19

Product Data Type: i1b (8, 16)

Total Bytes: 128

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: Spares in the telemetry. Dimensioned to 8 by 16 because 8 bytes occur per second.

Product Var Name i_et_cal_mode

Is element of: GLA03 Main Record

Short Description: Etalon Calibration - Current mode

Product Data Type: i1b (16)

Total Bytes: 16

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 3

Description: Current mode of Etalon calibration: OFF=0, Acquire=1, Tracking=2 or Invalid=3. Dimensioned to 16 because occurs once per second.

Comments:

Product Var Name i_ET_state

Is element of: GLA03 Main Record

Short Description: Etalon State

Product Data Type: i1b (16)

Total Bytes: 16

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 4

Description: The state of the etalon: Init=0, Set Temp=1, Wait=2, Average=3. Dimensioned to 16 because occurs once per second.

Comments:

Product Var Name i_ETsettleTime

Is element of: GLA03 Main Record

Short Description: Etalon Temperature Settle Time

Product Data Type: i1b (16)

Total Bytes: 16

Product Units: seconds

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: Etalon Temperature Settle Time. Dimensioned to 16 because occurs once per second.

Comments:

Product Var Name i_ET_Flags

Is element of: GLA03 Main Record

Short Description: Etalon Flags

Product Data Type: i1b (16)

Total Bytes: 16

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: Etalon Flags. Dimensioned to 16 because occurs once per second.

Comments:

Product Var Name i_et_onax_xmit

Is element of: GLA03 Main Record

Short Description: Etalon Averaged on-axis transmission

Product Data Type: i4b (16)

Total Bytes: 64

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 2147483647
Description: Etalon Averaged on-axis transmission. Dimensioned to 16 because occurs once per second.
Comments:

Product Var Name i_et_offax_xmit
Is element of: GLA03 Main Record
Short Description: Etalon Averaged off-axis transition
Product Data Type: i4b (16)
Total Bytes: 64
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 2147483647
Description: Etalon Averaged off-axis transmission. Dimensioned to 16 because occurs once per second.
Comments:

Product Var Name i_et_temperr
Is element of: GLA03 Main Record
Short Description: Etalon Temperature Error
Product Data Type: i4b (16)
Total Bytes: 64
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 2147483647
Description: Etalon Temperature Error. Dimensioned to 16 because occurs once per second.
Comments:

Product Var Name i_et_trkfltout
Is element of: GLA03 Main Record
Short Description: Etalon Tracking Loop Filter output
Product Data Type: i4b (16)
Total Bytes: 64

Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 2147483647
Description: Etalon Tracking Loop Filter output. Dimensioned to 16 because occurs once per second.
Comments:

Product Var Name i_et_trkfltavg
Is element of: GLA03 Main Record
Short Description: Etalon Tracking Failure Average
Product Data Type: i4b (16)
Total Bytes: 64
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 2147483647
Description: Etalon Tracking Failure Average. Dimensioned to 16 because occurs once per second.
Comments:

Product Var Name i_et_StartTemp
Is element of: GLA03 Main Record
Short Description: Start Temperature
Product Data Type: i1b (16)
Total Bytes: 16
Product Units: celsius
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 255
Description: Start Temperature. Dimensioned to 16 because occurs once per second.
Comments:

Product Var Name i_et_StopTemp
Is element of: GLA03 Main Record
Short Description: Stop Temperature

Product Data Type: i1b (16)
Total Bytes: 16
Product Units: celsius
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 255
Description: Stop Temperature. Dimensioned to 16 because occurs once per second.
Comments:

Product Var Name i_et_TempStep
Is element of: GLA03 Main Record
Short Description: Temperature Step
Product Data Type: i1b (16)
Total Bytes: 16
Product Units: celsius
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 255
Description: Temperature Step. Dimensioned to 16 because occurs once per second.
Comments:

Product Var Name i_et_acqavg_tm
Is element of: GLA03 Main Record
Short Description: Etalon Averaging time for acquire command
Product Data Type: i1b (16)
Total Bytes: 16
Product Units: seconds
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 255
Description: Etalon averaging time for acquire command. Dimensioned to 16 because occurs once per second.
Comments:

Product Var Name i_et_acqset_tm

Is element of: GLA03 Main Record

Short Description: Etalon Temperature settle time for acquire cmd

Product Data Type: i2b (16)

Total Bytes: 32

Product Units: seconds

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: Etalon Temperature settle time for acquire cmd. Dimensioned to 16 because occurs once per second.

Comments:

Product Var Name i_et_update_ctr

Is element of: GLA03 Main Record

Short Description: Etalon averaging update counter

Product Data Type: i1b (16)

Total Bytes: 16

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 255

Description: Etalon averaging update counter. Dimensioned to 16 because occurs once per second.

Comments:

Product Var Name i_et_spare

Is element of: GLA03 Main Record

Short Description: ET Spare

Product Data Type: i1b (16)

Total Bytes: 16

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: GLA03 et spare.

Product Var Name i_DualPinA

Is element of: GLA03 Main Record

Short Description: Dual Pin A

Product Data Type: i1b (40, 16)

Total Bytes: 640

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: From Laser Monitor Board. Each corresponds to one of the 40 shots. Dimensioned to 16 because occurs once per second.

Comments:

Product Var Name i_DualPinB

Is element of: GLA03 Main Record

Short Description: Dual Pin B

Product Data Type: i1b (40, 16)

Total Bytes: 640

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: From Laser Monitor Board. Each corresponds to one of the 40 shots. Dimensioned to 16 because occurs once per second.

Comments:

Product Var Name i_532nrg

Is element of: GLA03 Main Record

Short Description: Etalon 532 Energy

Product Data Type: i1b (40, 16)

Total Bytes: 640

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 32768

Description: Etalon 532 Energy.

Comments:

Product Var Name i_APID_AvFlg

Is element of: GLA03 Main Record

Short Description: Availability Flag

Product Data Type: i1b (8, 16)

Total Bytes: 128

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -127

Product Maximum: 127

Description: Flag indicating which packets (APIDs) for each second are available missing, or filled. APID 19 is broken down further into Altimeter Digitizer, Photon Counter, Cloud Digitizer, GPS/DEM, and C&T sections. Please see the PDF flag description for more details.

Comments:

Product Var Name i_timecorflg

Is element of: GLA01 Main Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: time correction flag

Product Data Type: i2b

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: Indicates what instrument or bias corrections were applied to the times on this record. Please see <a href='flags/i_timecorflg.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_spare4

Is element of: GLA03 Main Record

Short Description: Spare 4

Product Data Type: i1b (78)

Total Bytes: 78

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_rec_ndx

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: GLAS Record Index

Product Data Type: i4b

Total Bytes: 4

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: Unique index that relates this record to the corresponding record(s) in each GLAS data product.

Comments:

Product Var Name i_UTCTime

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Transmit Time of First Shot in frame in J2000

Product Data Type: i4b (2)

Total Bytes: 8

Product Units: seconds, microseconds

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: The transmit time of the first shot in the 1 second frame measured as 'UTC seconds' elapsed since Jan 1 2000 12:00:00 UTC. This time has been derived from the GPS time accounting for leap seconds. The first item is the whole number of seconds; the second item is the fractional part in microseconds.

Comments: This is not the ground bounce time, but the transmit time.

Product Var Name i_dShotTime

Is element of: GLA01 Main Record, GLA04 LPA Main Record, GLA05 record, GLA06 record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Laser Shot Time Deltas (shots 2-40)

Product Data Type: i4b (39)

Total Bytes: 156

Product Units: microseconds

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1200000

Description: The time deltas of pulses 2 through 40 to i_UTCTime, the UTC time tag of the first pulse in the 1-second data frame. Adding the deltas to i_UTCTime will give the user the time of each individual shot in the frame.

Comments: To calculate the time for shots 2-40, add these deltas to the time of the first shot.

Product Var Name i_shot_cntr

Is element of: GLA04 LPA Main Record

Short Description: Shot Counter

Product Data Type: i2b (40)

Total Bytes: 80

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 200

Description: The forty Shot Counters corresponding to LPA Data. These match the corresponding waveform records on the GLA01 product.

Comments:

Product Var Name i_GPSLatch

Is element of: GLA04 LPA Main Record

Short Description: GPS Latch Time

Product Data Type: i4b (2)

Total Bytes: 8

Product Units: seconds, microseconds

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: null

Product Maximum: null

Description: The GPS time that was used to convert the frequency board time to J2000 for the lasers shot times in this record. The GPS time is normally updated approximately every 10 seconds; the previous latch time will repeat until a new one is received.

Comments:

Product Var Name i_boxX

Is element of: GLA04 LPA Main Record

Short Description: X Position of Box

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 79

Description: X Coordinate for the top left corner of the 20 by 20 LPA image data, 0 to 79. To map the LPA image into the LRS image the LPA image needs to be rotated 90 degrees clockwise. So the LPA rotated to LRS (column) upper left X corner is 79 minus i_boxY minus 19.

Comments:

Product Var Name i_boxY

Is element of: GLA04 LPA Main Record

Short Description: Y Position of Box

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 79

Description: Y Coordinate for the top left corner of the 20 by 20 LPA image data, 0 to 79. To map the LPA image into the LRS image the LPA image needs to be rotated 90 degrees clockwise. So the LPA rotated to LRS (row) upper left Y corner is i_boxX.

Comments:

Product Var Name i_PixInt

Is element of: GLA04 LPA Main Record

Short Description: LPA Data

Product Data Type: i1b (400, 40)

Total Bytes: 16000

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: The forty per second images of the laser pulse. 20x20 box of LPA pixel intensity data. Row 1 column 1 to 20 first, then row 2 to 20. Row is Y and column is X. To map the LPA image into the LRS image the LPA image needs to be rotated 90 degrees clockwise.

Comments:

Product Var Name i_tx_wf

Is element of: GLA01 Main Record, GLA04 LPA Main Record

Short Description: Sampled Transmit Pulse Waveform

Product Data Type: i1b (48, 40)

Total Bytes: 1920

Product Units: counts

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: Transmit Pulse; 48 bytes of raw data samples.

Comments:

Product Var Name i_time_txWfPk

Is element of: GLA01 Main Record, GLA04 LPA Main Record

Short Description: Transmit Pulse Peak Location

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: ns

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 500000

Description: Address in digitizer counts of the Transmit Pulse Peak as measured from the start of Acquisition Memory, i.e. start of digitization. From APID12/13, Offset 68.

Comments: The range measurement starts from this time. To accurately time stamp the transmit pulse, it is necessary to add the delay to start of digitizer.

Product Var Name i_TxWfStart

Is element of: GLA01 Main Record, GLA04 LPA Main Record

Short Description: Starting Address of Transmit Pulse Sample

Product Data Type: i4b (40)

Total Bytes: 160

Product Units: ns

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 500000

Description: Starting Address in digitizer counts of the Transmit Pulse sample relative to the start of digitization. From APID12/13, Offset 76.

Comments:

Product Var Name i_txWfPk_Flag

Is element of: GLA01 Main Record, GLA04 LPA Main Record

Short Description: Transmit Waveform Peak Status Flag

Product Data Type: i1b (40)

Total Bytes: 40

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 8

Description: Transmit_Peak_Status. Status Word: Bit 0: If bit is set to 1 (true), then internal software failure. Bit 1: If bit is set to 1 (true), then peak is below threshold. Bit 2: If bit is set to 1 (true), peak was not found. Note: once set to true, Bit 2 is latched and is only cleared by a DSP board reset or by a ground command. From APID12/13, Offset 72.

Please see <a href='flags/i_txWfPk_Flag.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_lpa_spare0

Is element of: GLA04 LPA Main Record

Short Description: LPA Spare 0

Product Data Type: i1b (120)

Total Bytes: 120

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_APID_AvFlg

Is element of: GLA01 Main Record, GLA02 Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: APID Data Availability Flag

Product Data Type: i1b (8)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -127

Product Maximum: 127

Description: Flag indicating which packets (APIDs) for each second are available missing, or filled. APID 19 is broken down further into Altimeter Digitizer, Photon Counter, Cloud Digitizer, GPS/DEM, and C&T sections.

Please see the PDF flag description in the next section for more details.

Comments:

Product Var Name i_timecorflg

Is element of: GLA01 Main Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: time correction flag

Product Data Type: i2b

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: Indicates what instrument or bias corrections were applied to the times on this record. Please see <a href='flags/i_timecorflg.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_lpa_spare1

Is element of: GLA04 LPA Main Record

Short Description: LPA Spare 1

Product Data Type: i1b (6)

Total Bytes: 6

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_rec_ndx

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: GLAS Record Index

Product Data Type: i4b

Total Bytes: 4

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: Unique index that relates this record to the corresponding record(s) in each GLAS data product.

Comments:

Product Var Name i_UTCTime

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07

Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Transmit Time of First Shot in frame in J2000

Product Data Type: i4b (2)

Total Bytes: 8

Product Units: seconds, microseconds

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: The transmit time of the first shot in the 1 second frame measured as 'UTC seconds' elapsed since Jan 1 2000 12:00:00 UTC. This time has been derived from the GPS time accounting for leap seconds. The first item is the whole number of seconds; the second item is the fractional part in microseconds.

Comments: This is not the ground bounce time, but the transmit time.

Product Var Name i_samp_time

Is element of: GLA04 LRS Main Record

Short Description: Sample Time

Product Data Type: i4b (2, 10)

Total Bytes: 80

Product Units: seconds, microseconds

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: The 10 times of the LRS data as computed from the VTCW converted by using GPS if available and time offsets to the GLAS laser 10 hertz signal (every fourth fire cmd). The first item is the whole number of seconds since J2000; the second item is the fractional part in microseconds. (In UTC J2000 time).

Comments:

Product Var Name i_shot_time

Is element of: GLA04 LRS Main Record

Short Description: Shot time

Product Data Type: i4b (2, 10)

Total Bytes: 80

Product Units: seconds microseconds

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: The time for each of the 10 laser shots based on alignment to GLA01 using GPS time if available. The first item is the whole number of seconds since J2000; the second item is the fractional part in microseconds. (In UTC J2000 time)

Comments:

Product Var Name i_shot_ctr

Is element of: GLA04 LRS Main Record

Short Description: shot numbers

Product Data Type: i4b (10)

Total Bytes: 40

Product Units: counts

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 1

Product Maximum: 200

Description: Shot numbers for the 10 laser fire commands associated with the LRS data.

Comments:

Product Var Name i_lrs_vtcw

Is element of: GLA04 LRS Main Record

Short Description: LRS VTCW Time Tag

Product Data Type: i4b (2, 10)

Total Bytes: 80

Product Units: seconds, microseconds

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: Raw VTCW counts converted to seconds.

Comments:

Product Var Name i_lrs_timetag

Is element of: GLA04 LRS Main Record

Short Description: LRS Time Tag

Product Data Type: i4b (10)

Total Bytes: 40

Product Units: Microseconds

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1000000

Description: LRS SA-2 Time Tag, Sample 1-10. The time increment to GLAS 10 Hz pulse.

Comments:

Product Var Name i_lrs_msginc

Is element of: GLA04 LRS Main Record

Short Description: LRS Message Incomplete Flag

Product Data Type: i1b (10)

Total Bytes: 10

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1

Description: LRS SA-2 Message Incomplete Flag, Sample 1-10

Comments:

Product Var Name i_lrs_flag

Is element of: GLA04 LRS Main Record

Short Description: LRS Flag

Product Data Type: i1b (10)

Total Bytes: 10

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 255

Description: LRS Flag Byte. Please see <a href='flags/i_lrs_flag.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_lrs_TkrMode

Is element of: GLA04 LRS Main Record

Short Description: LRS Tracker Mode Status

Product Data Type: i1b (10)

Total Bytes: 10

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 7

Description: LRS SA-2 Tracker Mode Status, Sample 1-10

Comments:

Product Var Name i_lrs_tspare2

Is element of: GLA04 LRS Main Record

Short Description: LRS Spare 2

Product Data Type: i1b (10)

Total Bytes: 10

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: LRS SA-2 Spare 1, Sample 1-10

Product Var Name i_lrs_DiagStat

Is element of: GLA04 LRS Main Record

Short Description: LRS Diagnostic Sub-Mode Status

Product Data Type: i1b (10)

Total Bytes: 10

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1

Description: LRS SA-2 Diagnostic Sub-Mode Status, Sample 1-10

Comments:

Product Var Name i_lrs_LastPCmd

Is element of: GLA04 LRS Main Record

Short Description: LRS Last Processed Command ID

Product Data Type: i1b (10)

Total Bytes: 10

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: LRS SA-2 Last Processed Command ID, Sample 1-10

Comments:

Product Var Name i_lrs_RollCt

Is element of: GLA04 LRS Main Record

Short Description: LRS Time Tag Rollover Count

Product Data Type: i1b (10)

Total Bytes: 10

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: LRS SA-2 Time Tag Rollover Count, Samples 1-10

Comments:

Product Var Name i_lrs_tspare3

Is element of: GLA04 LRS Main Record

Short Description: LRS Spare 3

Product Data Type: i1b (10)

Total Bytes: 10

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: LRS SA-2 Spare 1, Sample 1-10

Product Var Name i_lrs_VTkrSt

Is element of: GLA04 LRS Main Record

Short Description: LRS Virtual Trackers State

Product Data Type: i1b (3, 10)

Total Bytes: 30

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: State of IST SA-8 Virtual Trackers 0-2 for Samples 1-10. For each tracker byte value indicates the state. Values are 0=Offline, 1=Standby, 2=Acq1, 3=Acq2, 4=RedAcq1, 5=RedAcq2, 6=Handoff1, 7=Handoff2, 8=Handoff3, 9=Handoff4, 10=Handoff5, 11=Track, 12=U12 bad, 13=U13 bad, 14=U14 bad, 15=AwaitAcq. Tracker 0 starts at byte 1.

Comments:

Product Var Name i_lrs_stat

Is element of: GLA04 LRS Main Record

Short Description: LRS SA-2 Status

Product Data Type: i1b (10)

Total Bytes: 10

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: IST SA-8 Bit Flags. Bit 7 = Fault Detection Summary (0/Clear 1/Set); Bit 6 = Cold Boot Indicator (0/Clear 1/Set); Bit 5 = Time Mark Received (0/Clear 1/Set); Bit 4 = Software Reset Event (0/Clear 1/Set); Bit 3 = Sync Mode (0/External 1/Internal); Bit 2 = Invalid Command (0/Clear 1/Set); Bit 1 = TEC Enbl/Dsbl Status (0/Dsbl 1/Enbl); Bit 0 = Command Ignored Flag (0/Clear 1/Set)

Comments:

Product Var Name i_lrs_TimeMark

Is element of: GLA04 LRS Main Record

Short Description: LRS Time Mark ID

Product Data Type: i1b (10)

Total Bytes: 10

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0
Product Maximum: 255
Description: LRS SA-2 Time Mark ID, Sample 1-10
Comments:

Product Var Name i_lrs_CamID
Is element of: GLA04 LRS Main Record
Short Description: LRS Camera ID
Product Data Type: i1b (10)
Total Bytes: 10
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 255
Description: LRS SA-2 Camera ID, Sample 1-10
Comments:

Product Var Name i_lrs_swVID
Is element of: GLA04 LRS Main Record
Short Description: LRS Software Version ID
Product Data Type: i1b (10)
Total Bytes: 10
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 255
Description: LRS SA-2 Software Version ID, Sample 1-10
Comments:

Product Var Name i_LPAC13_t1
Is element of: GLA03 Main Record, GLA04 LRS Main Record
Short Description: Laser Profiler Array (LPA) Temperature 1, Ch 13
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -1000

Product Maximum: 4000

Description: Oscillator Board Temperature, Ch 13

Comments:

Product Var Name i_Vtstarvalid

Is element of: GLA04 LRS Main Record

Short Description: LRS Virtual Tracker Star Valid

Product Data Type: i1b (3, 10)

Total Bytes: 30

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1

Description: Star Valid Flag for LRS SA-2 Virtual Trackers 0 - 2, Samples 1-10

Comments:

Product Var Name i_lrs_tspare4

Is element of: GLA04 LRS Main Record

Short Description: LRS Spare 4

Product Data Type: i1b (30)

Total Bytes: 30

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: Spares 4,5,6 from LRS SA-2 trackers 0-2, samples 1-10.

Product Var Name i_VTEEnergy

Is element of: GLA04 LRS Main Record

Short Description: LRS Virtual Tracker Encircled Energy

Product Data Type: i2b (3, 10)

Total Bytes: 60

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: Encircled Energy for LRS SA-2 Virtual Trackers 0 - 2, Samples 1-10

Comments:

Product Var Name i_VTBgBias

Is element of: GLA04 LRS Main Record

Short Description: LRS Virtual Tracker Bckgrnd Bias

Product Data Type: i2b (3, 10)

Total Bytes: 60

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 1023

Description: Backgrnd Bias for LRS SA-2 Virtual Trackers 0 - 2, Samples 1-10

Comments:

Product Var Name i_VTCentR

Is element of: GLA04 LRS Main Record

Short Description: LRS Virtual Tracker Centroid Row

Product Data Type: i4b (3, 10)

Total Bytes: 120

Product Units: Arc-seconds*1.0d6

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 1800000000

Description: Centroid Row from LRS SA-2 Virtual Trackers 0 - 2, Samples 1-10. Row is Y. The row (0 to 15) within the image data (i_T0_SA) is i_VTCentR minus i_lrs_RawRow.

Comments:

Product Var Name i_VTCentC

Is element of: GLA04 LRS Main Record

Short Description: LRS Virtual Tracker Centroid Column

Product Data Type: i4b (3, 10)

Total Bytes: 120

Product Units: Arc-seconds*1.0d6

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 1800000000

Description: Centroid Column from LRS SA-2 Virtual Trackers 0 - 2, Samples 1-10. Column is X. The column (0 to 15) within the image data (i_T0_SA) is i_VTCentC minus i_lrs_RawCol.

Comments:

Product Var Name i_lrsTimCofInt

Is element of: GLA04 LRS Main Record

Short Description: LRS Time to Center of Integration

Product Data Type: i4b (10)

Total Bytes: 40

Product Units: Microseconds

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 131070000

Description: LRS SA-29 Time to Center of Integration, Samples 1-10

Comments:

Product Var Name i_lrs_RawRow

Is element of: GLA04 LRS Main Record

Short Description: LRS Virtual Tracker Raw Row

Product Data Type: i2b (3, 10)

Total Bytes: 60

Product Units: pixels

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 495

Description: Raw row data from LRS SA-2 trackers 0-2, Samples 1-10. Raw Row (Y axis) is the upper left hand corner Y position of the LRS 16x16 image array (i_T0_SA).

Comments:

Product Var Name i_lrs_RawCol

Is element of: GLA04 LRS Main Record

Short Description: LRS Virtual Tracker Raw Column

Product Data Type: i2b (3, 10)

Total Bytes: 60

Product Units: pixels

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 495

Description: Raw column data from LRS SA-2 trackers 0-2, Samples 1-10. Raw column (X axis) is the upper left hand corner X position of the LRS 16x16 image array (i_T0_SA).

Comments:

Product Var Name i_lrs_TrkThr

Is element of: GLA04 LRS Main Record

Short Description: LRS Virtual Tracker Track Threshold

Product Data Type: i1b (3, 10)

Total Bytes: 30

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 2

Product Maximum: 255

Description: Threshold from LRS SA-2 trackers 0-2, Samples 1-10

Comments:

Product Var Name i_lrs_AcqThr

Is element of: GLA04 LRS Main Record

Short Description: LRS Acquisition Threshold

Product Data Type: i1b (10)

Total Bytes: 10

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 2

Product Maximum: 255

Description: LRS SA-2 Acquisition Threshold, Samples 1-10

Comments:

Product Var Name i_lrs_FOVEdge
Is element of: GLA04 LRS Main Record
Short Description: LRS FOV Entrance Edge
Product Data Type: i1b (10)
Total Bytes: 10
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 3
Description: LRS SA-2 FOV Entrance Edge, Samples 1-10
Comments:

Product Var Name iF1LTRSRSC26_t
Is element of: GLA03 Main Record, GLA04 LRS Main Record
Short Description: PRT, Face 1 LTR to SRS Temperature, Ch26
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 5000
Description: PRT, Stellar Reference System (SRS) Temperature, Ch 26
Comments:

Product Var Name i_lrs_IntTime
Is element of: GLA04 LRS Main Record
Short Description: LRS Integration Time
Product Data Type: i2b (10)
Total Bytes: 20
Product Units: milliseconds
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0

Product Maximum: 40

Description: LRS SA-2 Integration Time, Samples 1-10

Comments:

Product Var Name i_lrs_FrmCtr

Is element of: GLA04 LRS Main Record

Short Description: LRS Frame Counter

Product Data Type: i2b (10)

Total Bytes: 20

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 65535

Description: LRS SA-2 Frame Counter, Samples 1-10

Comments:

Product Var Name i_lrs_tspare7

Is element of: GLA04 LRS Main Record

Short Description: LRS Spare 7

Product Data Type: i1b (4, 10)

Total Bytes: 40

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: LRS SA-2 Spare 7, Samples 1-10

Product Var Name i_lrs_ccdtemp

Is element of: GLA04 LRS Main Record

Short Description: LRS SA-5 CCD Temperature

Product Data Type: i2b

Total Bytes: 2

Product Units: Celsius*100

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -27316

Product Maximum: 23880

Description: Counts to degree C value in deg C = Counts/128 -273.16 The 273 changes K to C degrees Scale it by 100 on product output to keep .01 degrees

Comments:

Product Var Name i_lrslenscellt

Is element of: GLA04 LRS Main Record

Short Description: LRS SA-5 Lens Cell Temperature

Product Data Type: i2b

Total Bytes: 2

Product Units: Celsius*100

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -27316

Product Maximum: 23880

Description:

Comments:

Product Var Name i_trkr_subject

Is element of: GLA04 LRS Main Record

Short Description: Tracker Subject

Product Data Type: i1b

Total Bytes: 1

Product Units: null

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 63

Description: Tells what the tracker is tracking: 0=> Star Data, 1=> Laser Data, 2=> Collimated Data. The one byte looks like | 0 0 | T 2 | T 1 | T 0 | where T0 = Tracker 0, T 1 is tracker 1 and T2 is tracker 2. The MSB will be set to 00.

Comments:

Product Var Name i_spare

Is element of: GLA04 LRS Main Record

Short Description: Spare

Product Data Type: i1b (3)

Total Bytes: 3

Product Units: null

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: null

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: GLA04_LRS Spare.

Product Var Name i_T0_shot_no

Is element of: GLA04 LRS Main Record

Short Description: shot number

Product Data Type: i4b

Total Bytes: 4

Product Units: NA

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 200

Description: Shot number of the first frame.

Comments:

Product Var Name i_T0_frame

Is element of: GLA04 LRS Main Record

Short Description: T0 Frame number

Product Data Type: i2b (5)

Total Bytes: 10

Product Units: n/a

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: No

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 65535

Description: Two byte word describing the frame.

Comments:

Product Var Name i_T0_SA

Is element of: GLA04 LRS Main Record

Short Description: LRS SA Virtual Tracker 0 Data

Product Data Type: i2b (256, 5)

Total Bytes: 2560

Product Units: null

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: null

Product Maximum: null

Description: The image will be a 16 X 16 pixel image. The first word (2byte) in the PRAP data contains the frame number. It has been set to the same value as the second pixel so that automatic scaling in plots can work. Order of the data is: row 1 column 1 to 16; row2 column 1 to 16; ....; row 16 column 1 to 16. Column is X and Row is Y.

Comments:

Product Var Name i_lrs_spare2

Is element of: GLA04 LRS Main Record

Short Description: LRS Spare2

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: NA

Invalid Value/Flag: N/A

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: NA

Product Maximum: NA

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_T1_shot_no

Is element of: GLA04 LRS Main Record

Short Description: shot number

Product Data Type: i4b

Total Bytes: 4

Product Units: counts

Invalid Value/Flag: No

Is Correction Flag?: No

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 200

Description: Shot number of the first frame.

Comments:

Product Var Name i_T1_frame

Is element of: GLA04 LRS Main Record

Short Description: Tracker 1 Frame Number

Product Data Type: i2b (4)

Total Bytes: 8

Product Units: counts

Invalid Value/Flag: gi_invalid_i2b

Is Correction Flag?: No

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 65535

Description: Two byte word describing the frame

Comments:

Product Var Name i_T1_SA

Is element of: GLA04 LRS Main Record

Short Description: LRS SA Virtual Tracker 1 Data

Product Data Type: i2b (256, 4)

Total Bytes: 2048

Product Units: null

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: null

Product Maximum: null

Description: The image will be a 16 X 16 pixel image. The first word(2byte) in the PRAP data contains the frame number. It has been set to the same value as the second pixel so no automatic scaling will take place.

Comments:

Product Var Name i_T2_shot_no

Is element of: GLA04 LRS Main Record

Short Description: shot numbers

Product Data Type: i4b

Total Bytes: 4

Product Units: null

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: null

Product Maximum: null

Description:

Comments:

Product Var Name i_T2_frame

Is element of: GLA04 LRS Main Record

Short Description: Tracker2 Frame Number

Product Data Type: i2b

Total Bytes: 2

Product Units: counts

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: No

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 65535

Description: Two byte word describing the frame

Comments:

Product Var Name i_T2_SA

Is element of: GLA04 LRS Main Record

Short Description: LRS SA Virtual Tracker 2 Data

Product Data Type: i2b (256)

Total Bytes: 512

Product Units: null

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: null

Product Maximum: null

Description: The image will be a 16 X 16 pixel image. The first word(2byte) in the PRAP data contains the frame number. It has been set to the same value as the second pixel so no automatic scaling will take place.

Comments:

Product Var Name i_APID_AvFlg

Is element of: GLA01 Main Record, GLA02 Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: APID Data Availability Flag

Product Data Type: i1b (8)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -127

Product Maximum: 127

Description: Flag indicating which packets (APIDs) for each second are available missing, or filled. APID 19 is broken down further into Altimeter Digitizer, Photon Counter, Cloud Digitizer, GPS/DEM, and C&T sections.

Please see the PDF flag description in the next section for more details.

Comments:

Product Var Name i_timecorflg

Is element of: GLA01 Main Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: time correction flag

Product Data Type: i2b

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: Indicates what instrument or bias corrections were applied to the times on this record. Please see <a href='flags/i_timecorflg.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name iF2LTRSRSC27_t

Is element of: GLA03 Main Record, GLA04 LRS Main Record

Short Description: PRT, Face 2 LTR to SRS Temperature, Ch27

Product Data Type: i2b

Total Bytes: 2

Product Units: Celsius X 100

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 5000

Description: PRT, Lidar Detector Pkg? Temperature, Ch 27

Comments:

Product Var Name i_TsPMir_t
Is element of: GLA03 Main Record, GLA04 LRS Main Record
Short Description: Telescope Region 0 Primary Mirror Temperature
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000
Product Maximum: 3000
Description: Telescope Region 0 Primary Mirror
Comments:

Product Var Name i_TsSMir_t
Is element of: GLA03 Main Record, GLA04 LRS Main Record
Short Description: Telescope Region 1 Secondary Mirror Temperature
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1000
Product Maximum: 3000
Description: Telescope Region 1 Secondary Mirror
Comments:

Product Var Name i_srs_ff_optio_t
Is element of: GLA03 Main Record, GLA04 LRS Main Record
Short Description: SRS First Fold Optics Temperature
Product Data Type: i2b
Total Bytes: 2
Product Units: Celsius X 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 5000
Description: SRS First Fold Optics Temperature

Comments:

Product Var Name i_rec_ndx

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: GLAS Record Index

Product Data Type: i4b

Total Bytes: 4

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: Unique index that relates this record to the corresponding record(s) in each GLAS data product.

Comments:

Product Var Name i_UTCTime

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Transmit Time of First Shot in frame in J2000

Product Data Type: i4b (2)

Total Bytes: 8

Product Units: seconds, microseconds

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: The transmit time of the first shot in the 1 second frame measured as 'UTC seconds' elapsed since Jan 1 2000 12:00:00 UTC. This time has been derived from the GPS time accounting for leap seconds. The first item is the whole number of seconds; the second item is the fractional part in microseconds.

Comments: This is not the ground bounce time, but the transmit time.

Product Var Name i_samp_time

Is element of: GLA04 GYRO Main Record

Short Description: Sample Time

Product Data Type: i4b (2, 10)

Total Bytes: 80

Product Units: seconds, microseconds

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: The 10 times associated with the gyro data samples in the packet. Time in UTC seconds computed from corresponding VTCW converted by using GPS if available.The first item is the whole number of seconds since J2000; the second item is the fractional part in microseconds. (In UTC J2000 time)

Comments:

Product Var Name i_siru_vtcw

Is element of: GLA04 GYRO Main Record

Short Description: SIRU VTCW

Product Data Type: i4b (2, 10)

Total Bytes: 80

Product Units: seconds, microseconds

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: Raw VTCW counts converted to seconds.

Comments:

Product Var Name i_siru_valdata

Is element of: GLA04 GYRO Main Record

Short Description: SIRU Data Valid Word

Product Data Type: i2b (10)

Total Bytes: 20

Product Units: n/a

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 65535

Description: The SIRU Data Valid Word is composed of bit flags: Mode Valid (1/Valid, 0/Invalid); Gyro Scale Factor (1/High, 0/Low); Gyro A Angle Valid (1/Valid, 0/Invalid); Gyro B Angle Valid (1/Valid, 0/Invalid); Gyro C Angle Valid (1/Valid, 0/Invalid); Gyro D Angle Valid (1/Valid, 0/Invalid); Spare 1 (4 bits unused); Gyro A Rate Saturation (1/Saturated, 0/Normal); Gyro B Rate Saturation (1/Saturated, 0/Normal); Gyro C Rate Saturation (1/Saturated, 0/Normal); Gyro D Rate Saturation (1/Saturated, 0/Normal); Heater Power Status (1/Off or Error, 0/Normal); Spare 2 (1 bit unused). One flag word per sample; 10 samples per second.

Please see <a href='flags/i_siru_valdata.pdf'> the PDF flag description in the next section for more details.
Comments:

Product Var Name i_siru_AIA
Is element of: GLA04 GYRO Main Record
Short Description: SIRU Gyro A Integrated Angle
Product Data Type: i2b (10)
Total Bytes: 20
Product Units: Arc-Seconds*20
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 3600
Description: 10 samples per second.
Comments:

Product Var Name i_siru_BIA
Is element of: GLA04 GYRO Main Record
Short Description: SIRU Gyro B Integrated Angle
Product Data Type: i2b (10)
Total Bytes: 20
Product Units: Arc-Seconds*20
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 3600
Description: 10 samples per second.
Comments:

Product Var Name i_siru_CIA
Is element of: GLA04 GYRO Main Record
Short Description: SIRU Gyro C Integrated Angle
Product Data Type: i2b (10)
Total Bytes: 20
Product Units: Arc-Seconds*20
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes

Product Minimum: 0
Product Maximum: 3600
Description: 10 samples per second.
Comments:

Product Var Name i_siru_DIA
Is element of: GLA04 GYRO Main Record
Short Description: SIRU Gyro D Integrated Angle
Product Data Type: i2b (10)
Total Bytes: 20
Product Units: Arc-Seconds*20
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 3600
Description: 10 samples per second.
Comments:

Product Var Name i_siru_ttag
Is element of: GLA04 GYRO Main Record
Short Description: SIRU Time Tag (free-run bin clock)
Product Data Type: i4b (10)
Total Bytes: 40
Product Units: Microseconds
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 4194240
Description: 10 samples per second.
Comments:

Product Var Name i_siru_config
Is element of: GLA04 GYRO Main Record
Short Description: SIRU Configuration Word, Sample 1
Product Data Type: i2b (10)
Total Bytes: 20
Product Units: n/a
Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 65535

Description: The SIRU Configuration Word is composed of bit flags: Gyro A Status (1/Active, 0/Inactive); Gyro B Status (1/Active, 0/Inactive); Gyro C Status (1/Active, 0/Inactive); Gyro D Status (1/Active, 0/Inactive); CPU/HCM Channel 1 Status (1/Active, 0/Inactive); CPU/HCM Channel 2 Status (1/Active, 0/Inactive); Power Supply 1 Status (1/Active, 0/Inactive); Power Supply 2 Status (1/Active, 0/Inactive); Reserved (4 bits); Spare 3 (4 bits unused). One flag word per sample; 10 samples per second.

Please see <a href='flags/i_siru_config.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_APID_AvFlg

Is element of: GLA01 Main Record, GLA02 Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: APID Data Availability Flag

Product Data Type: i1b (8)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -127

Product Maximum: 127

Description: Flag indicating which packets (APIDs) for each second are available missing, or filled. APID 19 is broken down further into Altimeter Digitizer, Photon Counter, Cloud Digitizer, GPS/DEM, and C&T sections.

Please see the PDF flag description in the next section for more details.

Comments:

Product Var Name i_timecorflg

Is element of: GLA01 Main Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: time correction flag

Product Data Type: i2b

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: Indicates what instrument or bias corrections were applied to the times on this record. Please see <a href='flags/i_timecorflg.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_gyro_spare1

Is element of: GLA04 GYRO Main Record

Short Description: Gyro Spare1

Product Data Type: i1b (6)

Total Bytes: 6

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_rec_ndx

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: GLAS Record Index

Product Data Type: i4b

Total Bytes: 4

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: Unique index that relates this record to the corresponding record(s) in each GLAS data product.

Comments:

Product Var Name i_UTCTime

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Transmit Time of First Shot in frame in J2000

Product Data Type: i4b (2)

Total Bytes: 8

Product Units: seconds, microseconds

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: The transmit time of the first shot in the 1 second frame measured as 'UTC seconds' elapsed since Jan 1 2000 12:00:00 UTC. This time has been derived from the GPS time accounting for leap seconds. The first item is the whole

number of seconds; the second item is the fractional part in microseconds.

Comments: This is not the ground bounce time, but the transmit time.

Product Var Name i_samp_time

Is element of: GLA04 IST Main Record

Short Description: Sample Time

Product Data Type: i4b (2, 10)

Total Bytes: 80

Product Units: seconds, microseconds

Invalid Value/Flag: gi_invalid_i4b

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: The 10 times of the IST data as computed from the VTCW converted by using GPS if available and time offsets to the GLAS laser 10 hertz signal (every fourth fire cmd). The first item is the whole number of seconds since J2000; the second item is the fractional part in microseconds. (In UTC J2000 time).

Comments:

Product Var Name i_shot_time

Is element of: GLA04 IST Main Record

Short Description: Shot times

Product Data Type: i4b (2, 10)

Total Bytes: 80

Product Units: seconds microseconds

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: null

Product Maximum: null

Description: The time for each of the 10 laser shots based on alignment with GLA01 using the GPS time if available. The first item is the whole number of seconds since J2000; the second item is the fractional part in microseconds. (In UTC J2000 time)

Comments:

Product Var Name i_shot_ctr

Is element of: GLA04 IST Main Record

Short Description: shot numbers

Product Data Type: i4b (10)

Total Bytes: 40

Product Units: counts

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: null

Product Maximum: null

Description: Shot numbers for the 10 laser fire commands associated with the IST data.

Comments:

Product Var Name i_ist_vtcw

Is element of: GLA04 IST Main Record

Short Description: IST VTCW Time Tag

Product Data Type: i4b (2, 10)

Total Bytes: 80

Product Units: seconds microseconds

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: Raw VTCW counts converted to seconds.

Comments:

Product Var Name i_ist_timetag

Is element of: GLA04 IST Main Record

Short Description: IST Time Tag

Product Data Type: i4b (10)

Total Bytes: 40

Product Units: Microseconds

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No
Product Minimum: 0
Product Maximum: 2147483647
Description: IST SA-8 Time Tag, Sample 1-10. The time increment to GLAS 10 Hz pulse.
Comments:

Product Var Name i_ist_msginc
Is element of: GLA04 IST Main Record
Short Description: IST Message Incomplete Flag
Product Data Type: i1b (10)
Total Bytes: 10
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 1
Description: IST SA-8 Message Incomplete Flag, Sample 1-10
Comments:

Product Var Name i_ist_RollCt
Is element of: GLA04 IST Main Record
Short Description: IST Time Tag Rollover Count
Product Data Type: i1b (10)
Total Bytes: 10
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 15
Description: IST SA-8 Time Tag Rollover Count, Sample 1-10
Comments:

Product Var Name i_ist_TkrMode
Is element of: GLA04 IST Main Record
Short Description: IST Tracker Mode Status
Product Data Type: i1b (10)
Total Bytes: 10
Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 7

Description: IST SA-8 Tracker Mode Status, Sample 1-10Comments:

Product Var Name i_ist_tspare1

Is element of: GLA04 IST Main Record

Short Description: IST Spare 1

Product Data Type: i1b (10)

Total Bytes: 10

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: IST SA-8 Spare 1, Sample 1-10

Product Var Name i_ist_DiagStat

Is element of: GLA04 IST Main Record

Short Description: IST Diagnostic Sub-Mode Status

Product Data Type: i1b (10)

Total Bytes: 10

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 1

Description: IST SA-8 Diagnostic Sub-Mode Status, Sample 1-10

Comments:

Product Var Name i_ist_LastPCmd

Is element of: GLA04 IST Main Record

Short Description: IST Last Processed Command ID

Product Data Type: i1b (10)

Total Bytes: 10

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: IST SA-8 Last Processed Command ID, Sample 1-10

Comments:

Product Var Name i_ist_VTkrSt

Is element of: GLA04 IST Main Record

Short Description: IST Virtual Trackers State

Product Data Type: i1b (6, 10)

Total Bytes: 60

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: State of IST SA-8 Virtual Trackers 0-5 for Samples 1-10. For each tracker byte value indicates the state. Values are 0=Offline, 1=Standby, 2=Acq1, 3=Acq2, 4=RedAcq1, 5=RedAcq2, 6=Handoff1, 7=Handoff2, 8=Handoff3, 9=Handoff4, 10=Handoff5, 11=Track, 12=U12 bad, 13=U13 bad, 14=U14 bad, 15=AwaitAcq. Tracker 0 starts at byte 1.

Comments:

Product Var Name i_ist_stat

Is element of: GLA04 IST Main Record

Short Description: IST SA-8 Status

Product Data Type: i1b (10)

Total Bytes: 10

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: IST SA-8 Bit Flags. Bit 7 = Fault Detection Summary (0/Clear 1/Set); Bit 6 = Cold Boot Indicator (0/Clear 1/Set); Bit 5 = Time Mark Received (0/Clear 1/Set); Bit 4 = Software Reset Event (0/Clear 1/Set); Bit 3 =

Bright Object Event (0/External 1/Internal); Bit 2 = Invalid Command (0/Clear 1/Set); Bit 1 = TEC Enbl/Dsbl Status (0/Dsbl 1/Enbl); Bit 0 = Command Ignored Flag (0/Clear 1/Set)

Comments:

Product Var Name i_ist_TimeMark

Is element of: GLA04 IST Main Record

Short Description: IST Time Mark ID

Product Data Type: i1b (10)

Total Bytes: 10

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: IST SA-8 Time Mark ID, Sample 1-10

Comments:

Product Var Name i_ist_CamID

Is element of: GLA04 IST Main Record

Short Description: IST Camera ID

Product Data Type: i1b (10)

Total Bytes: 10

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: IST SA-8 Camera ID, Sample 1-10

Comments:

Product Var Name i_ist_swVID

Is element of: GLA04 IST Main Record

Short Description: IST Software Version ID

Product Data Type: i1b (10)

Total Bytes: 10

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: IST SA-8 Software Version ID, Sample 1-10

Comments:

Product Var Name i_ist_flag

Is element of: GLA04 IST Main Record

Short Description: IST Flag

Product Data Type: i1b (10)

Total Bytes: 10

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 255

Description: IST Flag Byte. Please see <a href='flags/i_ist_flag.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name I_ist_spare1

Is element of: GLA04 IST Main Record

Short Description: IST Spare1

Product Data Type: i1b (2)

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_Vtstarvalid

Is element of: GLA04 IST Main Record

Short Description: IST Virtual Tracker Star Valid

Product Data Type: i1b (6, 10)

Total Bytes: 60

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 1
Description: Star Valid Flag for IST SA-8 Virtual Trackers 0 - 5, Samples 1-10
Comments:

Product Var Name i_VTEEnergy
Is element of: GLA04 IST Main Record
Short Description: IST Virtual Tracker Encircled Energy
Product Data Type: i2b (6, 10)
Total Bytes: 120
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 32678
Description: Encircled Energy for IST SA-8 Virtual Trackers 0 - 5, Samples 1-10
Comments:

Product Var Name i_VTBgBias
Is element of: GLA04 IST Main Record
Short Description: IST Virtual Tracker Bckgrnd Bias
Product Data Type: i2b (6, 10)
Total Bytes: 120
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 1024
Description: Backgrnd Bias for IST SA-8 Virtual Trackers 0 - 5, Samples 1-10
Comments:

Product Var Name i_VTStarMag
Is element of: GLA04 IST Main Record
Short Description: IST Virtual Tracker Star Magnitude
Product Data Type: i2b (6, 10)

Total Bytes: 120
Product Units: star magnitude*10
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 63
Description: Star Magnitude from IST SA-8 Virtual Trackers 0 - 5, Samples 1-10
Comments:

Product Var Name i_VTBoreH
Is element of: GLA04 IST Main Record
Short Description: IST Virtual Tracker Boresight H
Product Data Type: i4b (6, 10)
Total Bytes: 240
Product Units: Arc-seconds*100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1700000
Product Maximum: 1700000
Description: Boresight H from IST SA-8 Virtual Trackers 0 - 5, Samples 1-10
Comments:

Product Var Name i_VTBoreV
Is element of: GLA04 IST Main Record
Short Description: IST Virtual Tracker Boresight V
Product Data Type: i4b (6, 10)
Total Bytes: 240
Product Units: Arc-seconds*100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1700000
Product Maximum: 1700000
Description: Boresight V from IST SA-8 Virtual Trackers 0 - 5, Samples 1-10
Comments:

Product Var Name i_ist_FocLngth
Is element of: GLA04 IST Main Record

Short Description: IST Effective Focal Length
Product Data Type: i4b (10)
Total Bytes: 40
Product Units: Microns * 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 6535500
Description: IST SA-8 Effective Focal Length, Samples 1-10
Comments:

Product Var Name i_istTimCofInt
Is element of: GLA04 IST Main Record
Short Description: IST Time to Center of Integration
Product Data Type: i4b (10)
Total Bytes: 40
Product Units: Microseconds
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 131070000
Description: IST SA-29 Time to Center of Integration, Samples 1-10
Comments:

Product Var Name i_ist_BoreCol
Is element of: GLA04 IST Main Record
Short Description: IST Boresight Column
Product Data Type: i4b (10)
Total Bytes: 40
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 390000
Description: IST SA-29 Boresight Column, Samples 1-10
Comments:

Product Var Name i_ist_BoreRow
Is element of: GLA04 IST Main Record
Short Description: IST Boresight Row
Product Data Type: i4b (10)
Total Bytes: 40
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 390000
Description: IST SA-29 Boresight Row, Samples 1-10
Comments:

Product Var Name i_ist_CCDTemp
Is element of: GLA04 IST Main Record
Short Description: IST CCD Temperature
Product Data Type: i2b (10)
Total Bytes: 20
Product Units: Celsius*100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -27316
Product Maximum: 23880
Description: IST SA-29 CCD Temperature, Samples 1-10
Comments:

Product Var Name i_istLensCellT
Is element of: GLA04 IST Main Record
Short Description: IST Lens Cell Temperature
Product Data Type: i2b (10)
Total Bytes: 20
Product Units: Celsius*100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -27316
Product Maximum: 23880
Description: IST SA-29 Lens Cell Temperature, Samples 1-10

Comments:

Product Var Name i_APID_AvFlg

Is element of: GLA01 Main Record, GLA02 Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: APID Data Availability Flag

Product Data Type: i1b (8)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -127

Product Maximum: 127

Description: Flag indicating which packets (APIDs) for each second are available missing, or filled. APID 19 is broken down further into Altimeter Digitizer, Photon Counter, Cloud Digitizer, GPS/DEM, and C&T sections.

Please see the PDF flag description in the next section for more details.

Comments:

Product Var Name i_timecorflg

Is element of: GLA01 Main Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: time correction flag

Product Data Type: i2b

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: Indicates what instrument or bias corrections were applied to the times on this record. Please see <a href='flags/i_timecorflg.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_ist_spare2

Is element of: GLA04 IST Main Record

Short Description: IST Spare2

Product Data Type: i1b (6)

Total Bytes: 6

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments: GLA04_ist spare2.

Product Var Name i_rec_ndx

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: GLAS Record Index

Product Data Type: i4b

Total Bytes: 4

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: Unique index that relates this record to the corresponding record(s) in each GLAS data product.

Comments:

Product Var Name i_UTCTime

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Transmit Time of First Shot in frame in J2000

Product Data Type: i4b (2)

Total Bytes: 8

Product Units: seconds, microseconds

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: The transmit time of the first shot in the 1 second frame measured as 'UTC seconds' elapsed since Jan 1 2000 12:00:00 UTC. This time has been derived from the GPS time accounting for leap seconds. The first item is the whole number of seconds; the second item is the fractional part in microseconds.

Comments: This is not the ground bounce time, but the transmit time.

Product Var Name i_bst1_samp_time

Is element of: GLA04 BST Main Record

Short Description: BST1 Sample Time

Product Data Type: i4b (2, 10)

Total Bytes: 80

Product Units: seconds, microseconds

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: The time of the ten BST1 data. This time is computed using the VTCW counts and converted to seconds using GPS if available.

Comments:

Product Var Name i_bst1_vtcw

Is element of: GLA04 BST Main Record

Short Description: BST1 VTCW Time Tag

Product Data Type: i4b (2, 10)

Total Bytes: 80

Product Units: Microseconds

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: null

Description: BST1 VTCW counts converted to seconds.

Comments:

Product Var Name i_bst1_pchstat

Is element of: GLA04 BST Main Record

Short Description: BST1 Patch Execution Status

Product Data Type: i2b (10)

Total Bytes: 20

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 0

Description: 0 = No patches. 10 samples per second.

Comments:

Product Var Name i_bst1_datlat

Is element of: GLA04 BST Main Record

Short Description: BST1 Data Latency

Product Data Type: i4b (10)

Total Bytes: 40

Product Units: Microseconds

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 4194240

Description: 10 samples per second.

Comments:

Product Var Name i_bst1_sw1

Is element of: GLA04 BST Main Record

Short Description: BST1 Status Word 1

Product Data Type: i2b (10)

Total Bytes: 20

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 65535

Description: BST1 Status Word 1 is composed of bit flags: Position Uncalibrated (0/CalEnbl, 1/CalDsbl); Intensity Uncalibrated (0/CalEnbl, 1/CalDsbl); BITE Star On (0/NoBITE, 1/BITEOn); Background High (0/OK, 1/High); RAM Fail (0/OK, 1/Error); ROM Fail (0/OK, 1/Error); Star 5 Invalid (0/OK, 1/Invalid); Star 4 Invalid (0/OK, 1/Invalid); Star 3 Invalid (0/OK, 1/Invalid); Star 2 Invalid (0/OK, 1/Invalid); Star 1 Invalid (0/OK, 1/Invalid); Star 5 Track (0/NoTrack, 1/Track); Star 4 Track (0/NoTrack, 1/Track); Star 3 Track (0/NoTrack, 1/Track); Star 2 Track (0/NoTrack, 1/Track); Star 1 Track (0/NoTrack, 1/Track). One status word per sample; 10 samples per second. Please see <a href='flags/i_bst_sw1.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_bst1_sw2

Is element of: GLA04 BST Main Record

Short Description: BST1 Status Word 2

Product Data Type: i2b (10)

Total Bytes: 20

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 65535

Description: BST1 Status Word 2 is composed of bit flags: Star 5 Directed Search (0/NoSrch, 1/Search); Star 4 Directed Search (0/NoSrch, 1/Search); Star 3 Directed Search (0/NoSrch, 1/Search); Star 2 Directed Search (0/NoSrch, 1/Search); Star 1 Directed Search (0/NoSrch, 1/Search); Full Field Search (0/NoSrch, 1/Search); Calibration Override (0/NoOverride, 1/Override); Unsync (0/OK, 1/Unsync); Download (0/NoDnld, 1/Dnld); Stack Error (0/OK, 1/Error); Smoothed Raw Data (0/NoSmooth, 1/Smoothed); Watchdog Timeout (0/OK, 1/Timeout); Data Error (0/OK, 1/Error); Data Upset (0/OK, 1/Upset); RAM Execution (0/ROM, 1/RAM); Reset (0/Clear, 1/Reset). One status word per sample; 10 samples per second. Please see <a href='flags/i_bst_sw2.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_bst1_mctr

Is element of: GLA04 BST Main Record

Short Description: BST1 Message Counter

Product Data Type: i2b (10)

Total Bytes: 20

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 65535

Description: 10 samples per second.

Comments:

Product Var Name i_bst1_recctr

Is element of: GLA04 BST Main Record

Short Description: BST1 Command Received Counter

Product Data Type: i1b (10)

Total Bytes: 10

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0
Product Maximum: 255
Description: 10 samples per second.
Comments:

Product Var Name i_bst1_rejctr
Is element of: GLA04 BST Main Record
Short Description: BST1 Command Rejected Counter
Product Data Type: i1b (10)
Total Bytes: 10
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 255
Description: 10 samples per second
Comments:

Product Var Name i_bst1_starX
Is element of: GLA04 BST Main Record
Short Description: BST1 Star Position X
Product Data Type: i4b (5, 10)
Total Bytes: 200
Product Units: Arc-SecondsX100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 360000
Description: Position X of 5 stars at 10 samples per second.
Comments:

Product Var Name i_bst1_starY
Is element of: GLA04 BST Main Record
Short Description: BST1 Star Position Y
Product Data Type: i4b (5, 10)
Total Bytes: 200
Product Units: Arc-SecondsX100
Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 360000
Description: Position Y of 5 stars at 10 samples per second.
Comments:

Product Var Name i_bst1_starInt
Is element of: GLA04 BST Main Record
Short Description: BST1 Star Intensity
Product Data Type: i4b (5, 10)
Total Bytes: 200
Product Units: Magnitude*100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -250000
Product Maximum: 250000
Description: Intensity of 5 stars at 10 samples per second.
Comments:

Product Var Name i_bst1_ccdtemp
Is element of: GLA04 BST Main Record
Short Description: BST1 CCD Temperature
Product Data Type: i2b (10)
Total Bytes: 20
Product Units: Celsius* 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -32677
Product Maximum: 32678
Description: 10 samples per second.
Comments:

Product Var Name i_bst1_bptemp
Is element of: GLA04 BST Main Record
Short Description: BST1 Baseplate Temperature
Product Data Type: i2b (10)
Total Bytes: 20

Product Units: Celsius* 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -32677
Product Maximum: 32678
Description: 10 samples per second.
Comments:

Product Var Name i_bst1_lenstmp
Is element of: GLA04 BST Main Record
Short Description: BST1 Lens Temperature
Product Data Type: i2b (10)
Total Bytes: 20
Product Units: Celsius* 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -32677
Product Maximum: 32678
Description: 10 samples per second.
Comments:

Product Var Name i_bst1_8V
Is element of: GLA04 BST Main Record
Short Description: BST1 +8 Volt Supply
Product Data Type: i1b (10)
Total Bytes: 10
Product Units: Volt * 10
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -127
Product Maximum: 127
Description: 10 samples per second.
Comments:

Product Var Name i_bst1_n9V
Is element of: GLA04 BST Main Record
Short Description: BST1 -9 Volt Supply

Product Data Type: i1b (10)
Total Bytes: 10
Product Units: Volt * 10
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -127
Product Maximum: 127
Description: 10 samples per second.
Comments:

Product Var Name i_bst1_4V
Is element of: GLA04 BST Main Record
Short Description: BST1 +4 Volt Supply
Product Data Type: i1b (10)
Total Bytes: 10
Product Units: Volt * 10
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -127
Product Maximum: 127
Description: 10 samples per second.
Comments:

Product Var Name i_bst1_n5V
Is element of: GLA04 BST Main Record
Short Description: BST1 -5 Volt Supply
Product Data Type: i1b (10)
Total Bytes: 10
Product Units: Volt * 10
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -127
Product Maximum: 127
Description: 10 samples per second.
Comments:

Product Var Name i_bst1_BG

Is element of: GLA04 BST Main Record

Short Description: BST1 Background Reading

Product Data Type: i2b (10)

Total Bytes: 20

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -32767

Product Maximum: 32767

Description: 10 samples per second.

Comments: From Paul Woznick: The background count should be treated as signed. A negative count means that the tracker has been light saturated for a longer period of time and because the reference voltage is dynamic, can result in a negative output.

Product Var Name i_bst1_srchct

Is element of: GLA04 BST Main Record

Short Description: BST1 Full Field Search Count

Product Data Type: i1b (10)

Total Bytes: 10

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: 10 samples per second.

Comments:

Product Var Name i_bst1_Fact

Is element of: GLA04 BST Main Record

Short Description: BST1 False Alarms Count

Product Data Type: i1b (10)

Total Bytes: 10

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: 10 samples per second.

Comments:

Product Var Name i_bst1_sernum
Is element of: GLA04 BST Main Record
Short Description: BST1 Serial Number
Product Data Type: i1b (10)
Total Bytes: 10
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 255
Description: 10 samples per second.
Comments:

Product Var Name i_bst1_swver
Is element of: GLA04 BST Main Record
Short Description: BST1 Software Revision Code
Product Data Type: i1b (10)
Total Bytes: 10
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 255
Description: One revision code per sample; 10 samples per second.
Comments:

Product Var Name i_bst1_cancode
Is element of: GLA04 BST Main Record
Short Description: BST1 Cancel Code Word
Product Data Type: i2b (10)
Total Bytes: 20
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0

Product Maximum: 65535

Description: BST1 Cancel Code Word; 3 bits for each star (1-5); bit 15 is spare. The flag values are: 0/NoTerm, 1/Overlap, 2/NoFOV, 3/TooDark, 4/HotPixel, 5/ColumnDefect, 6/BreakTrack, 7/Dropped. Star 1 flag starts at bit 0. One code word per sample; 10 samples per second.

Please see <a href='flags/i_bst_cancode.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_bst_spare1

Is element of: GLA04 BST Main Record

Short Description: BST Spare1

Product Data Type: i1b (8)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_bst2_samp_time

Is element of: GLA04 BST Main Record

Short Description: BST2 Sample Time

Product Data Type: i4b (2, 10)

Total Bytes: 80

Product Units: seconds, microseconds

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 2147483647

Description: The time of the ten BST2 data. This time is computed using the VTCW counts and converted to seconds using GPS if available.

Comments:

Product Var Name i_bst2_vtcw

Is element of: GLA04 BST Main Record

Short Description: BST2 VTCW Time Tag

Product Data Type: i4b (2, 10)

Total Bytes: 80

Product Units: Microseconds
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: null
Description: BST2 raw VTCW converted to seconds.
Comments:

Product Var Name i_bst2_pchstat
Is element of: GLA04 BST Main Record
Short Description: BST2 Patch Execution Status
Product Data Type: i2b (10)
Total Bytes: 20
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 0
Description: 0 = No patches. 10 samples per second.
Comments:

Product Var Name i_bst2_datlat
Is element of: GLA04 BST Main Record
Short Description: BST2 Data Latency
Product Data Type: i4b (10)
Total Bytes: 40
Product Units: Microseconds
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 4194240
Description: 10 samples per second.
Comments:

Product Var Name i_bst2_sw1
Is element of: GLA04 BST Main Record
Short Description: BST2 Status Word 1

Product Data Type: i2b (10)

Total Bytes: 20

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 65535

Description: BST2 Status Word 1 is composed of bit flags: Position Uncalibrated (0/CalEnbl, 1/CalDsbl); Intensity Uncalibrated (0/CalEnbl, 1/CalDsbl); BITE Star On (0/NoBITE, 1/BITEOn); Back);ground High (0/OK, 1/High); RAM Fail (0/OK, 1/Error); ROM Fail (0/OK, 1/Error); Star 5 Invalid (0/OK, 1/Invalid); Star 4 Invalid (0/OK, 1/Invalid); Star 3 Invalid (0/OK, 1/Invalid); Star 2 Invalid (0/OK, 1/Invalid); Star 1 Invalid (0/OK, 1/Invalid); Star 5 Track (0/NoTrack, 1/Track); Star 4 Track (0/NoTrack, 1/Track); Star 3 Track (0/NoTrack, 1/Track); Star 2 Track (0/NoTrack, 1/Track); Star 1 Track (0/NoTrack, 1/Track). One status word per sample; 10 samples per second. Please see <a href='flags/i_bst_sw1.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_bst2_sw2

Is element of: GLA04 BST Main Record

Short Description: BST2 Status Word 2

Product Data Type: i2b (10)

Total Bytes: 20

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 65535

Description: BST2 Status Word 2 is composed of bit flags: Star 5 Directed Search (0/NoSrch, 1/Search); Star 4 Directed Search (0/NoSrch, 1/Search); Star 3 Directed Search (0/NoSrch, 1/Search); Star 2 Directed Search (0/NoSrch, 1/Search); Star 1 Directed Search (0/NoSrch, 1/Search); Full Field Search (0/NoSrch, 1/Search); Calibration Override (0/NoOverride, 1/Override); Unsync (0/OK, 1/Unsync); Download (0/NoDnld, 1/Dnld); Stack Error (0/OK, 1/Error); Smoothed Raw Data (0/NoSmooth, 1/Smoothed); Watchdog Timeout (0/OK, 1/Timeout); Data Error (0/OK, 1/Error); Data Upset (0/OK, 1/Upset); RAM Execution (0/ROM, 1/RAM); Reset (0/Clear, 1/Reset). One status word per sample; 10 samples per second. Please see <a href='flags/i_bst_sw2.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_bst2_mctr

Is element of: GLA04 BST Main Record

Short Description: BST2 Message Counter

Product Data Type: i2b (10)

Total Bytes: 20

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 65535
Description: 10 samples per second.
Comments:

Product Var Name i_bst2_recctr
Is element of: GLA04 BST Main Record
Short Description: BST2 Command Received Counter
Product Data Type: i1b (10)
Total Bytes: 10
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 255
Description: 10 samples per second.
Comments:

Product Var Name i_bst2_rejctr
Is element of: GLA04 BST Main Record
Short Description: BST2 Command Rejected Counter
Product Data Type: i1b (10)
Total Bytes: 10
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 255
Description: 10 samples per second.
Comments:

Product Var Name i_bst2_starX
Is element of: GLA04 BST Main Record
Short Description: BST2 Star Position X
Product Data Type: i4b (5, 10)
Total Bytes: 200

Product Units: Arc-Seconds*100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 360000
Description: Position X of 5 stars at 10 samples per second.
Comments:

Product Var Name i_bst2_starY
Is element of: GLA04 BST Main Record
Short Description: BST2 Star Position Y
Product Data Type: i4b (5, 10)
Total Bytes: 200
Product Units: Arc-Seconds*100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 360000
Description: Position Y of 5 stars at 10 samples per second.
Comments:

Product Var Name i_bst2_starInt
Is element of: GLA04 BST Main Record
Short Description: BST2 Star Intensity
Product Data Type: i4b (5, 10)
Total Bytes: 200
Product Units: Magnitude*100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -250000
Product Maximum: 250000
Description: Intensity of 5 stars at 10 samples per second.
Comments:

Product Var Name i_bst2_ccdtemp
Is element of: GLA04 BST Main Record
Short Description: BST2 CCD Temperature

Product Data Type: i2b (10)
Total Bytes: 20
Product Units: Celsius* 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -32677
Product Maximum: 32678
Description: 10 samples per second.
Comments:

Product Var Name i_bst2_bptemp
Is element of: GLA04 BST Main Record
Short Description: BST2 Baseplate Temperature
Product Data Type: i2b (10)
Total Bytes: 20
Product Units: Celsius* 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -32677
Product Maximum: 32678
Description: 10 samples per second.
Comments:

Product Var Name i_bst2_lenstmp
Is element of: GLA04 BST Main Record
Short Description: BST2 Lens Temperature
Product Data Type: i2b (10)
Total Bytes: 20
Product Units: Celsius* 100
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -32677
Product Maximum: 32678
Description: 10 samples per second.
Comments:

Product Var Name i_bst2_8V

Is element of: GLA04 BST Main Record
Short Description: BST2 +8 Volt Supply
Product Data Type: i1b (10)
Total Bytes: 10
Product Units: Volt * 10
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -127
Product Maximum: 127
Description: 10 samples per second.
Comments:

Product Var Name i_bst2_n9V
Is element of: GLA04 BST Main Record
Short Description: BST2 -9 Volt Supply
Product Data Type: i1b (10)
Total Bytes: 10
Product Units: Volt * 10
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -127
Product Maximum: 127
Description: 10 samples per second.
Comments:

Product Var Name i_bst2_4V
Is element of: GLA04 BST Main Record
Short Description: BST2 +4 Volt Supply
Product Data Type: i1b (10)
Total Bytes: 10
Product Units: Volt * 10
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -127
Product Maximum: 127
Description: 10 samples per second.
Comments:

Product Var Name i_bst2_n5V

Is element of: GLA04 BST Main Record

Short Description: BST2 -5 Volt Supply

Product Data Type: i1b (10)

Total Bytes: 10

Product Units: Volt * 10

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -127

Product Maximum: 127

Description: 10 samples per second.

Comments:

Product Var Name i_bst2_BG

Is element of: GLA04 BST Main Record

Short Description: BST2 Background Reading

Product Data Type: i2b (10)

Total Bytes: 20

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -32767

Product Maximum: 32767

Description: 10 samples per second.

Comments: From Paul Woznick: The background count should be treated as signed. A negative count means that the tracker has been light saturated for a longer period of time and because the reference voltage is dynamic, can result in a negative output.

Product Var Name i_bst2_srchct

Is element of: GLA04 BST Main Record

Short Description: BST2 Full Field Search Count

Product Data Type: i1b (10)

Total Bytes: 10

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255
Description: 10 samples per second
.Comments:

Product Var Name i_bst2_Fact
Is element of: GLA04 BST Main Record
Short Description: BST2 False Alarms Count
Product Data Type: i1b (10)
Total Bytes: 10
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 255
Description: 10 samples per second.
Comments:

Product Var Name i_bst2_sernum
Is element of: GLA04 BST Main Record
Short Description: BST2 Serial Number
Product Data Type: i1b (10)
Total Bytes: 10
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 255
Description: 10 samples per second.
Comments:

Product Var Name i_bst2_swver
Is element of: GLA04 BST Main Record
Short Description: BST2 Software Revision Code
Product Data Type: i1b (10)
Total Bytes: 10
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 255

Description: One revision code per sample; 10 samples per second.

Comments:

Product Var Name i_bst2_cancode

Is element of: GLA04 BST Main Record

Short Description: BST2 Cancel Code Word

Product Data Type: i2b (10)

Total Bytes: 20

Product Units: N/A

Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA

Is Unsigned?: Yes

Product Minimum: 0

Product Maximum: 65535

Description: BST2 Cancel Code Word; 3 bits for each star (1-5); bit 15 is spare. The flag values are: 0/NoTerm, 1/Overlap, 2/NoFOV, 3/TooDark, 4/HotPixel, 5/ColumnDefect, 6/BreakTrack, 7/Dropped. Star 1 flag starts at bit 0. One code word per sample; 10 samples per second.

Please see <a href='flags/i_bst_cancode.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_APID_AvFlg

Is element of: GLA01 Main Record , GLA02 Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: APID Data Availability Flag

Product Data Type: i1b (8)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -127

Product Maximum: 127

Description: Flag indicating which packets (APIDs) for each second are available missing, or filled. APID 19 is broken down further into Altimeter Digitizer, Photon Counter, Cloud Digitizer, GPS/DEM, and C&T sections.

Please see the PDF flag description in the next section for more details.

Comments:

Product Var Name i_timecorflg

Is element of: GLA01 Main Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: time correction flag

Product Data Type: i2b

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: Indicates what instrument or bias corrections were applied to the times on this record. Please see <a href='flags/i_timecorflg.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_bst_spare2

Is element of: GLA04 BST Main Record

Short Description: BST Spare2

Product Data Type: i1b (6)

Total Bytes: 6

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

Comments:

Product Var Name i_rec_ndx

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: GLAS Record Index

Product Data Type: i4b

Total Bytes: 4

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: Unique index that relates this record to the corresponding record(s) in each GLAS data product.

Comments:

Product Var Name i_UTCTime

Is element of: GLA01 Long Waveform Record, GLA01 Main Record, GLA01_Short_Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: Transmit Time of First Shot in frame in J2000

Product Data Type: i4b (2)

Total Bytes: 8

Product Units: seconds, microseconds

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 2147483647

Description: The transmit time of the first shot in the 1 second frame measured as 'UTC seconds' elapsed since Jan 1 2000 12:00:00 UTC. This time has been derived from the GPS time accounting for leap seconds. The first item is the whole number of seconds; the second item is the fractional part in microseconds.

Comments: This is not the ground bounce time, but the transmit time.

Product Var Name i_samp_time

Is element of: GLA04 SCPA Main Record

Short Description: Sample time

Product Data Type: i4b (2)

Total Bytes: 8

Product Units: seconds microseconds

Invalid Value/Flag: No

Is Correction Flag?: No

Is Unsigned?: NA

Product Minimum: 0

Product Maximum: 2147483647

Description: The time for the s/c data based on the GPS time latched to VTCW. The first item is the whole number of seconds since J2000; the second item is the fractional part in microseconds. (In UTC J2000 time)

Comments:

Product Var Name i_scpa_vtcw

Is element of: GLA04 SCPA Main Record
Short Description: S/C Data VTCW Time Tag
Product Data Type: i4b (2)
Total Bytes: 8
Product Units: seconds, microseconds
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: 0
Product Maximum: 2147483647
Description: Raw VTCW counts converted to seconds
Comments:

Product Var Name i_CFA_Q1
Is element of: GLA04 SCPA Main Record
Short Description: Control Frame Att Quaternion Q1
Product Data Type: i4b
Total Bytes: 4
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1100000
Product Maximum: 1100000
Description: The spacecraft control frame attitude quaternion 1 from the ADCS Data.
Comments:

Product Var Name i_CFA_Q2
Is element of: GLA04 SCPA Main Record
Short Description: Control Frame Att Quaternion Q2
Product Data Type: i4b
Total Bytes: 4
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1100000
Product Maximum: 1100000
Description: The spacecraft control frame attitude quaternion 2 from the ADCS Data.
Comments:

Product Var Name i_CFA_Q3
Is element of: GLA04 SCPA Main Record
Short Description: Control Frame Att Quaternion Q3
Product Data Type: i4b
Total Bytes: 4
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1100000
Product Maximum: 1100000
Description: The spacecraft control frame attitude quaternion 3 from the ADCS Data.
Comments:

Product Var Name i_CFA_Q4
Is element of: GLA04 SCPA Main Record
Short Description: Control Frame Att Quaternion Q4
Product Data Type: i4b
Total Bytes: 4
Product Units: N/A
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1100000
Product Maximum: 1100000
Description: The spacecraft control frame attitude quaternion 4 from the ADCS Data.
Comments:

Product Var Name i_ECIOrb_PosX
Is element of: GLA04 SCPA Main Record
Short Description: Next ECI Orbital Position X
Product Data Type: i4b
Total Bytes: 4
Product Units: meters
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -8169500
Product Maximum: 8169500

Description: The spacecraft's next ECI Orbital Position X from the ADCS Data.
Comments:

Product Var Name i_ECIOrb_PosY
Is element of: GLA04 SCPA Main Record
Short Description: Next ECI Orbital Position Y
Product Data Type: i4b
Total Bytes: 4
Product Units: meters
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -8169500
Product Maximum: 8169500
Description: The spacecraft's next ECI Orbital Position Y from the ADCS Data.
Comments:

Product Var Name i_ECIOrb_PosZ
Is element of: GLA04 SCPA Main Record
Short Description: Next ECI Orbital Position Z
Product Data Type: i4b
Total Bytes: 4
Product Units: meters
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -8169500
Product Maximum: 8169500
Description: The spacecraft's next ECI Orbital Position Z from the ADCS Data.
Comments:

Product Var Name i_ECIOrb_VelX
Is element of: GLA04 SCPA Main Record
Short Description: Next ECI Orbital Velocity X
Product Data Type: i4b
Total Bytes: 4
Product Units: cm/sec
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No

Product Minimum: -1045696
Product Maximum: 1045696
Description: The spacecraft's next ECI Orbital Velocity X from the ADCS Data.
Comments:

Product Var Name i_ECIOrb_VelY
Is element of: GLA04 SCPA Main Record
Short Description: Next ECI Orbital Velocity Y
Product Data Type: i4b
Total Bytes: 4
Product Units: cm/sec
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1045696
Product Maximum: 1045696
Description: The spacecraft's next ECI Orbital Velocity Y from the ADCS Data.
Comments:

Product Var Name i_ECIOrb_VelZ
Is element of: GLA04 SCPA Main Record
Short Description: Next ECI Orbital Velocity Z
Product Data Type: i4b
Total Bytes: 4
Product Units: cm/sec
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -1045696
Product Maximum: 1045696
Description: The spacecraft's next ECI Orbital Velocity Z from the ADCS Data.
Comments:

Product Var Name i_SA_Pos1
Is element of: GLA04 SCPA Main Record
Short Description: Calculated SA 1 Position
Product Data Type: i4b
Total Bytes: 4
Product Units: radians*1.0E+6
Invalid Value/Flag: i_APID_AvFlg

Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -65536
Product Maximum: 65536
Description: The spacecraft calculated SA 1 Position from the ADCS Data.
Comments:

Product Var Name i_SA_Pos2
Is element of: GLA04 SCPA Main Record
Short Description: Calculated SA 2 Position
Product Data Type: i4b
Total Bytes: 4
Product Units: radians*1.0E+6
Invalid Value/Flag: i_APID_AvFlg
Is Correction Flag?: NA
Is Unsigned?: No
Product Minimum: -65536
Product Maximum: 65536
Description: The spacecraft calculated SA 2 Position from the ADCS Data.
Comments:

Product Var Name i_gps_latch
Is element of: GLA04 SCPA Main Record
Short Description: GPS Latched VTCW
Product Data Type: i2b (3)
Total Bytes: 6
Product Units: microseconds
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: null
Product Maximum: null
Description:
Comments:

Product Var Name i_gps_time
Is element of: GLA04 SCPA Main Record
Short Description: GPS Time of Current Solution
Product Data Type: i4b
Total Bytes: 4

Product Units: seconds
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: null
Product Maximum: null
Description:
Comments:

Product Var Name i_SA_CntrFlg1
Is element of: GLA04 SCPA Main Record
Short Description: SA 1 Autonomous Control Flag
Product Data Type: i1b
Total Bytes: 1
Product Units: n/a
Invalid Value/Flag: No
Is Correction Flag?: NA
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 1
Description: Points indicate whether or not solar array articulation is enabled or inhibited.
Comments:

Product Var Name i_SA_CntrFlg2
Is element of: GLA04 SCPA Main Record
Short Description: SA 2 Autonomous Control Flag
Product Data Type: i1b
Total Bytes: 1
Product Units: n/a
Invalid Value/Flag: No
Is Correction Flag?: No
Is Unsigned?: Yes
Product Minimum: 0
Product Maximum: 1
Description: Points indicate whether or not solar array articulation is enabled or inhibited.
Comments:

Product Var Name i_APID_AvFlg
Is element of: GLA01 Main Record, GLA02 Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: APID Data Availability Flag

Product Data Type: i1b (8)

Total Bytes: 8

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: -127

Product Maximum: 127

Description: Flag indicating which packets (APIDs) for each second are available missing, or filled. APID 19 is broken down further into Altimeter Digitizer, Photon Counter, Cloud Digitizer, GPS/DEM, and C&T sections.

Please see the PDF flag description in the next section for more details.

Comments:

Product Var Name i_timecorflg

Is element of: GLA01 Main Record, GLA02 Record, GLA03 Main Record, GLA04 BST Main Record, GLA04 GYRO Main Record, GLA04 IST Main Record, GLA04 LPA Main Record, GLA04 LRS Main Record, GLA04 SCPA Main Record, GLA05 record, GLA06 record, GLA07 Record, GLA08 Record, GLA09 Record, GLA10 record, GLA11 Record, GLA12 Record, GLA13 Record, GLA14 Record, GLA15 Record

Short Description: time correction flag

Product Data Type: i2b

Total Bytes: 2

Product Units: N/A

Invalid Value/Flag: No

Is Correction Flag?: No

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 32767

Description: Indicates what instrument or bias corrections were applied to the times on this record. Please see <a href='flags/i_timecorflg.pdf'> the PDF flag description in the next section for more details.

Comments:

Product Var Name i_scpa_spare1

Is element of: GLA04 SCPA Main Record

Short Description: SCPA Spare 1

Product Data Type: i1b (4)

Total Bytes: 4

Product Units: n/a

Invalid Value/Flag: No

Is Correction Flag?: NA

Is Unsigned?: No

Product Minimum: 0

Product Maximum: 0

Description: This variable consists of spare bytes reserved for architectural consistency of the data file. It contains no meaningful information.

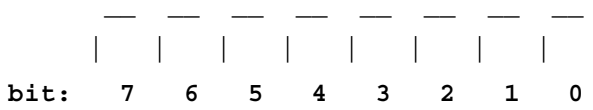
Comments:

Section 5

Flags

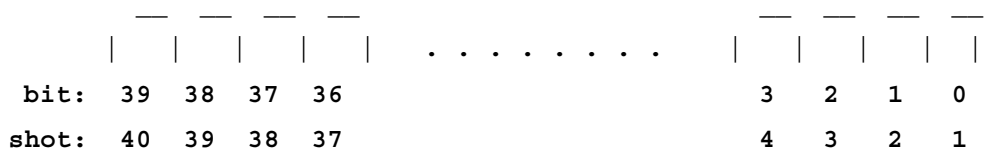
5.1 Flag Design Philosophy

GSAS flag design is governed by a consistent design philosophy. Per big-endian convention, bits are numbered right to left starting at 0. E.g., a byte has the following bit numbers:

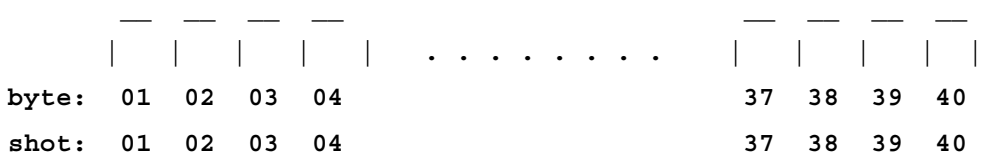


However, arrays of bytes are numbered left to right starting at 1. The direction from which shots are incremented depend if the flag is a byte flag or bit flag. Byte flags increment from left to right, bit flags increment from right to left. This follows the "natural" big endian ordering scheme. E.g.:

BIT flags increment from right to left:



BYTE flags increment from left to right:



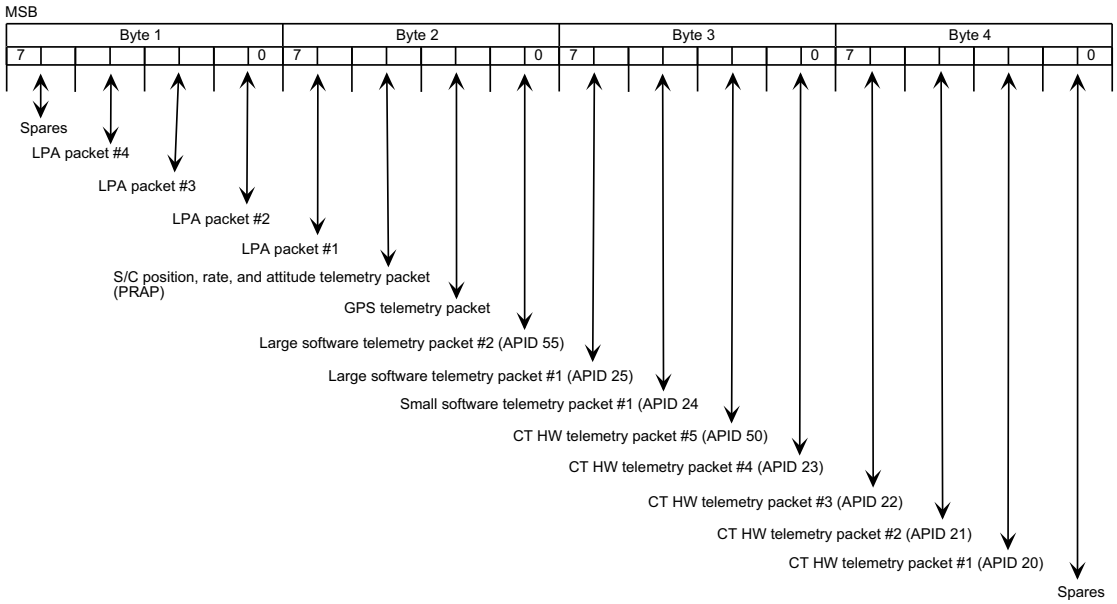
The following section contains detailed descriptions of each flag found in the GLAS standard data products. The descriptions are ordered alphabetically.

5.2 PDF Flag Descriptions

i_APID_AvFlg [1/sec for GLA01, 02, 04-07, 12-15], [1/16 sec for GLA03]: APID Data Availability Flag

Page 1 of 2

2 bit sets of values; 0= present, 1=filled at EDOS, 2=never received - ISIPS filled



i_APID_AvFlg [1/sec for GLA01, 02, 04-07, 12-15], [1/16 sec for GLA03]: APID Data Availability Flag (continued)

Page 2 of 2

2 bit sets of values; 0= present, 1=filled at EDOS, 2=never received - ISIPS filled

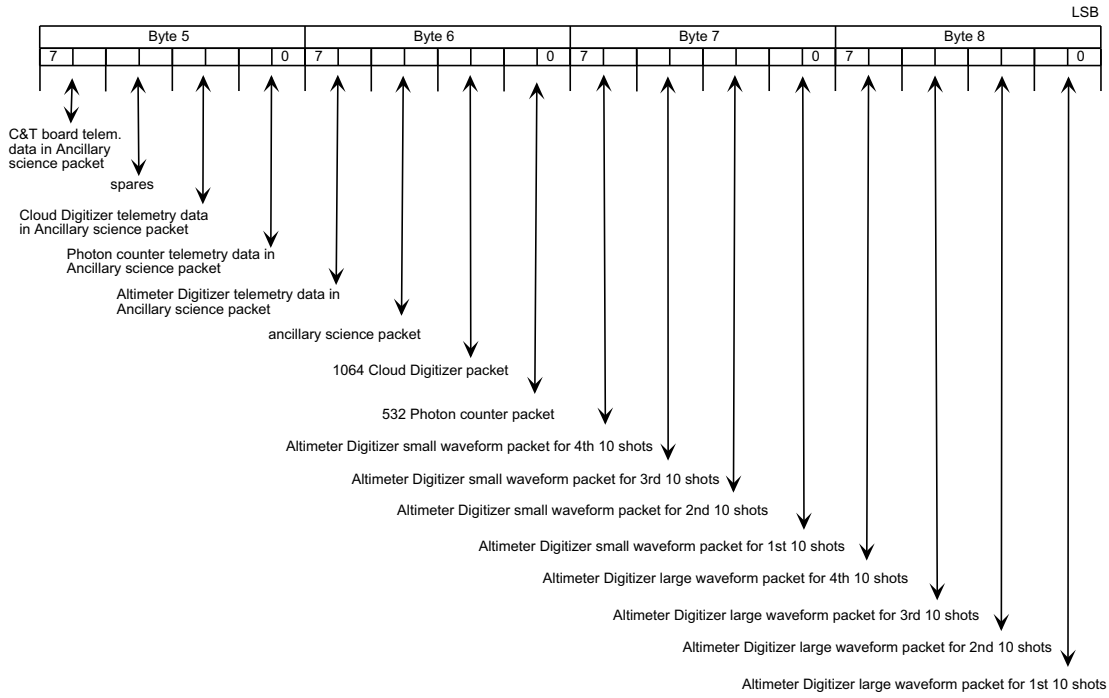


Figure 5-1 APID Data Availability Flag

i_FiltNumMask [GLA01_Main]: Filter Section Mask

1 bit set of values: 0 = not selectable, 1 = selectable

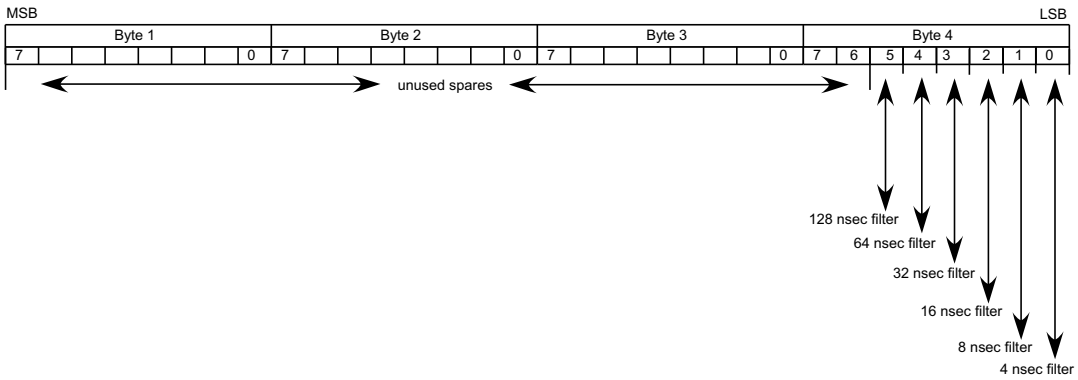


Figure 5-2 Filter Section Mask

i_GainShiftFlg [1/sec for GLA01_main]: Gain Shift Flag; One flag per shot; indicates if the gain has been shifted for the corresponding measurement. 1-bit flags, 40/second.

0=Gain has been shifted (valid)
1=Gain has not been shifted (potentially invalid)

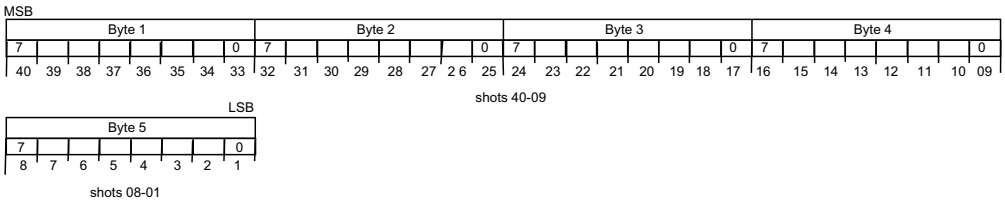


Figure 5-3 Gain Shift Flag

i_InstState [GLA01_main]: Instrument State Flag

1 bit set of values: 0 = Disabled/Off, 1 = Enabled/On

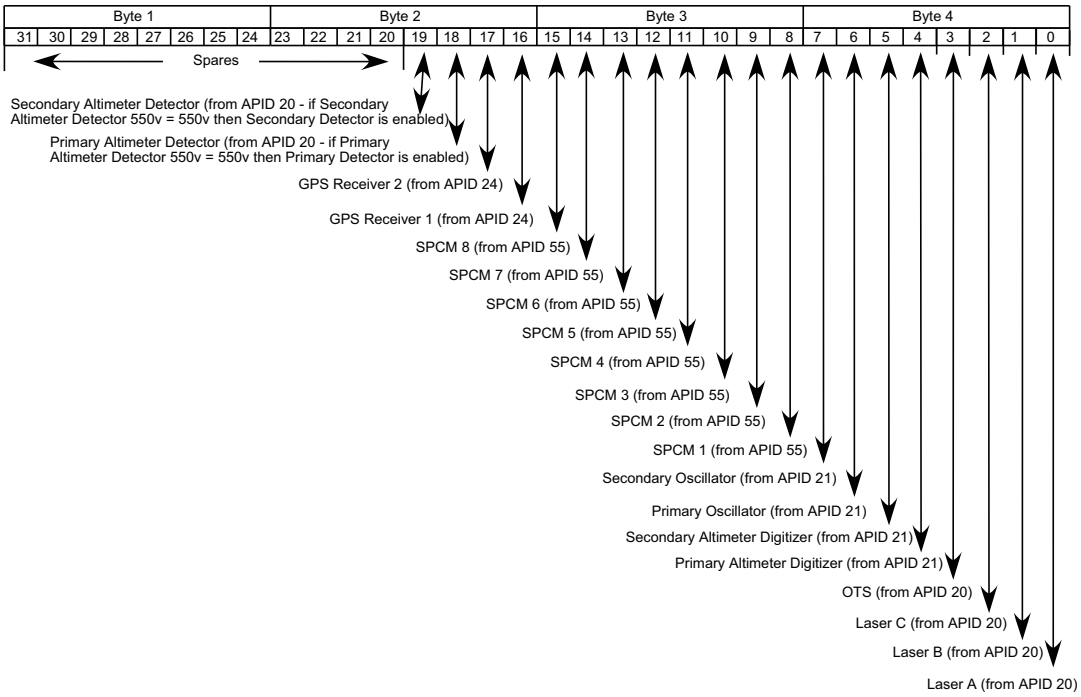


Figure 5-4 Instrument State Flag

i_ObSurfType [GLA01]: Surface Type

1 byte set of values: 0 = ocean & no ice, 1 = land & no ice, 2 = ocean & ice, 3 = land & ice

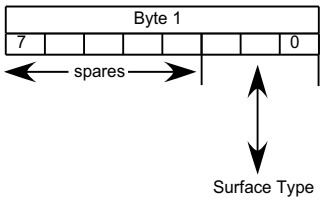


Figure 5-5 Surface Type

i_OrbFlg [1/sec for GLA01, 02, 05-15]: Orbit Flag

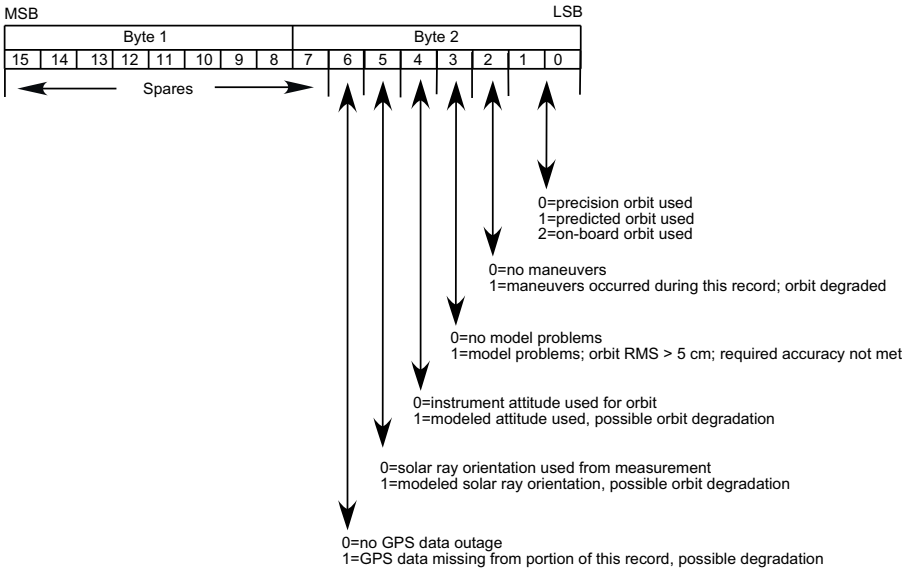


Figure 5-6 Orbit Flag

i_RngSrc_Flag [GLA01_Main]:Range Data Source Flag

1 byte set of values: 0 = s/c time and position packet, 1 = uplinked DEM bytes, 2 = uplinked Rmin/Rmax

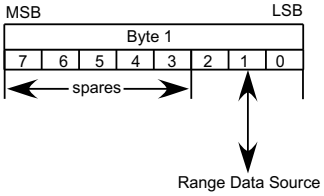


Figure 5-7 Range Data Source Flag

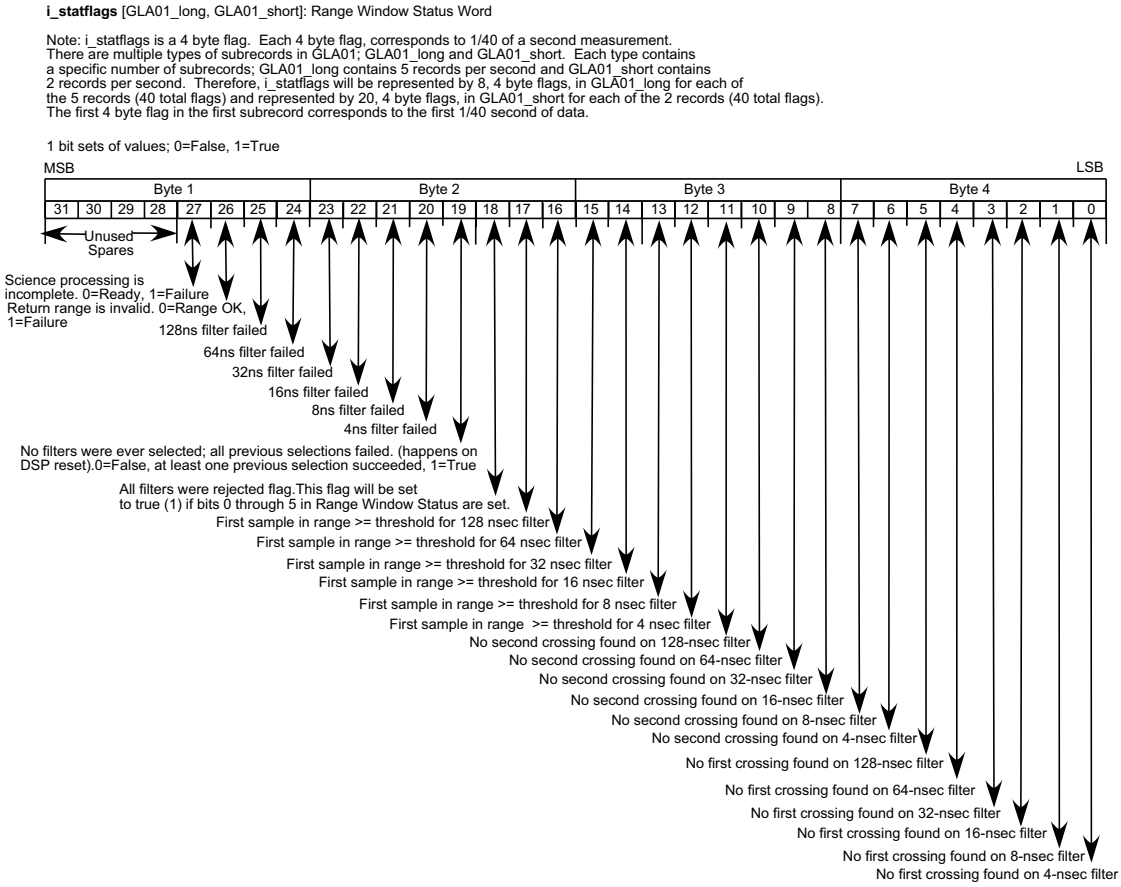


Figure 5-8 Range Window Status Word

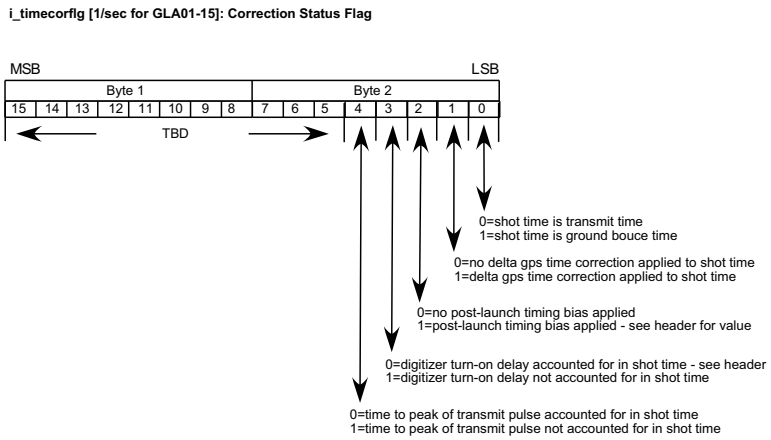


Figure 5-9 Correction Status Flag

i_TxFlg [1/sec for GLA01_main]: Transmit Pulse Flag; One flag per shot; indicates quality to use based on valid or invalid criteria
1-bit flags, 40/second.

0=Transmit Pulse is telemetered (valid)
1=Transmit Pulse is not telemetered (invalid)

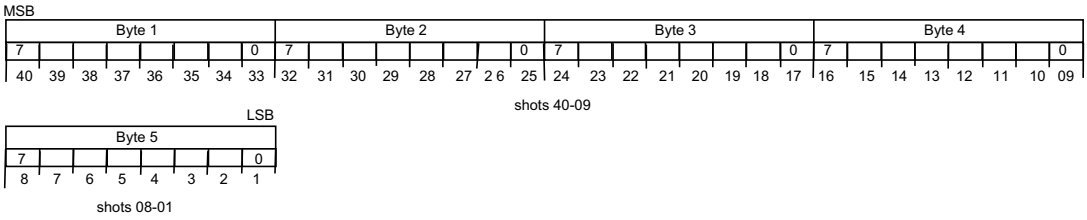


Figure 5-10 Transmit Pulse Flag

i_txWfPk_Flag [GLA01_Main, GLA04-01(LPA)]: Transmit Waveform Peak Status Flag

Note: i_txWfPk_Flag is a 1 byte flag. One byte corresponds to 1/40 of a second.
The first byte flag corresponds to the first 1/40 second of data.

1 bit flags, 40 per second

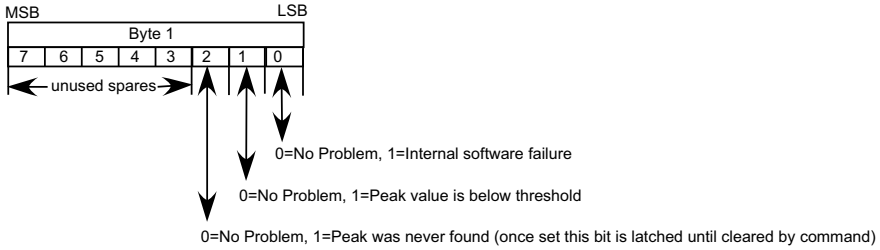


Figure 5-11 Transmit Waveform Peak Status Flag

i_g_IntRet_qf [GLA02]: Integrated Return Quality Flag

4-bit set of values: 0 = unused, 1 = excellent, 2 = good, 3 = marginal, 5 = bad data

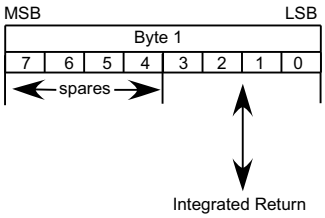


Figure 5-12 Integrated Return Quality Flag

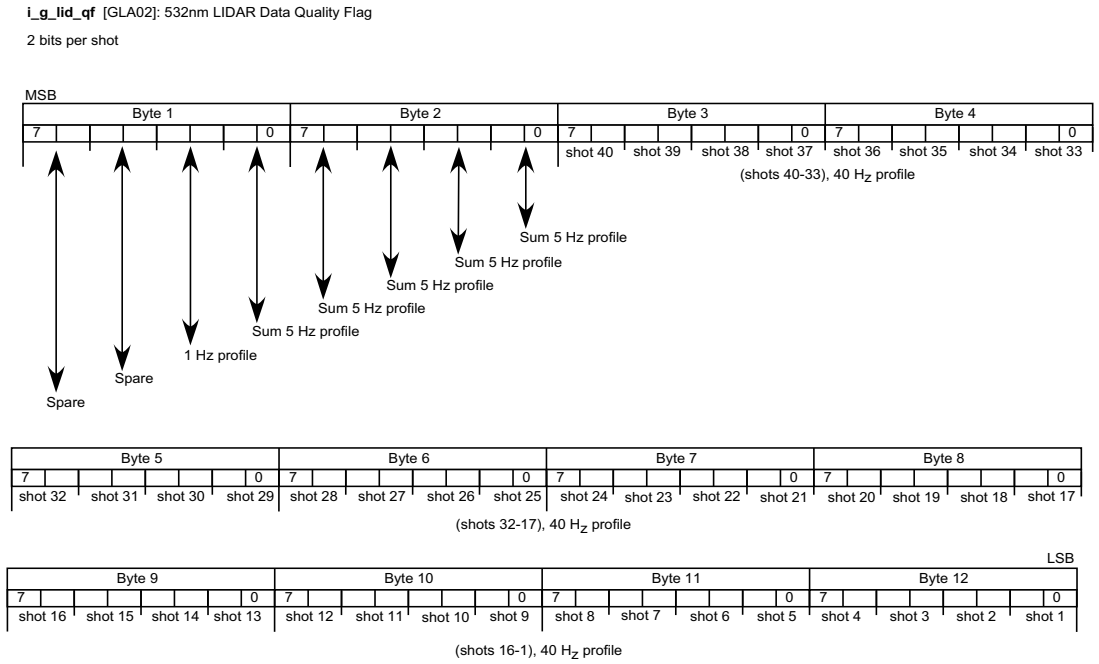


Figure 5-13 532nm LIDAR Data Quality Flag

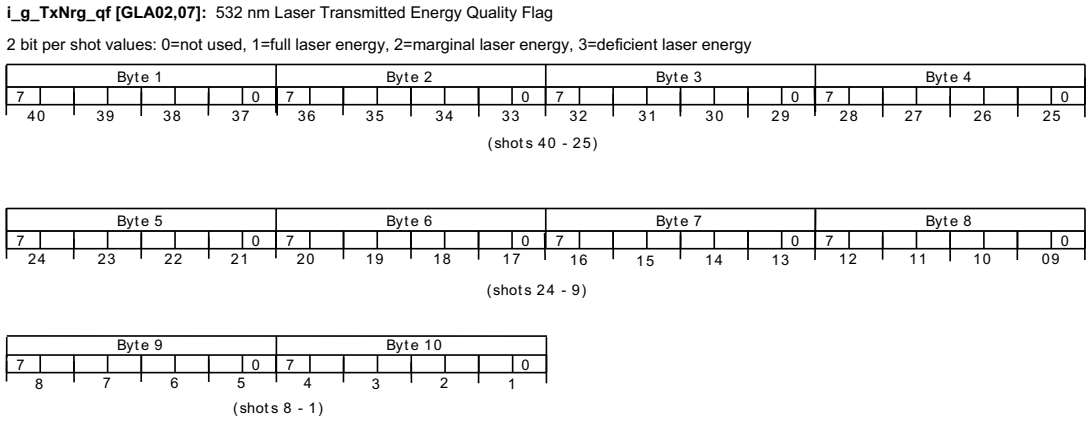


Figure 5-14 532 nm Laser Transmitted Energy Quality Flag

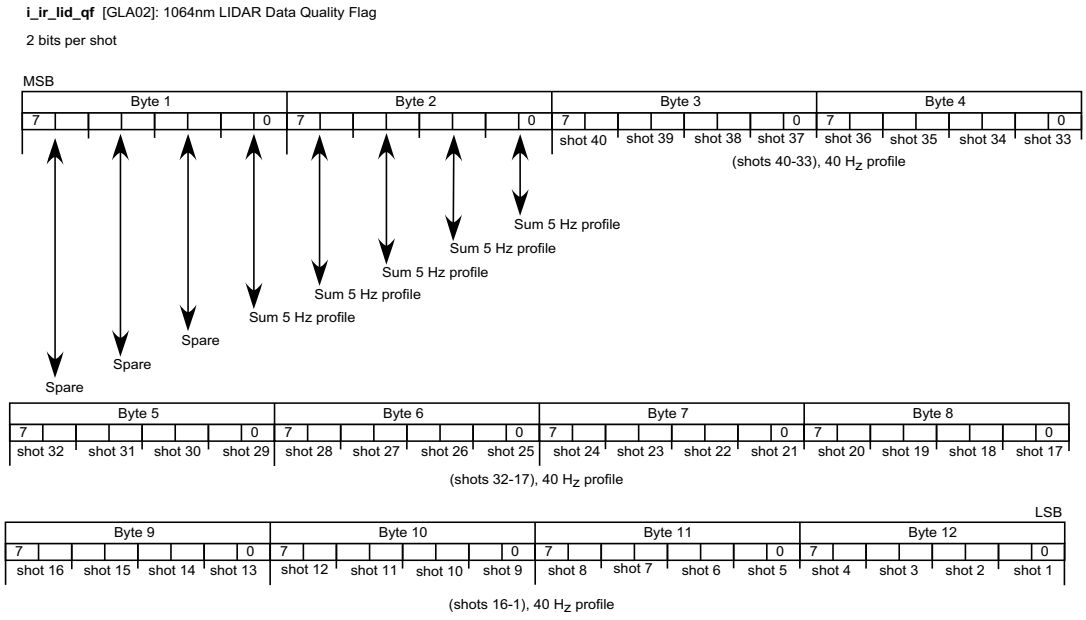


Figure 5-15 1064nm LIDAR Data Quality Flag

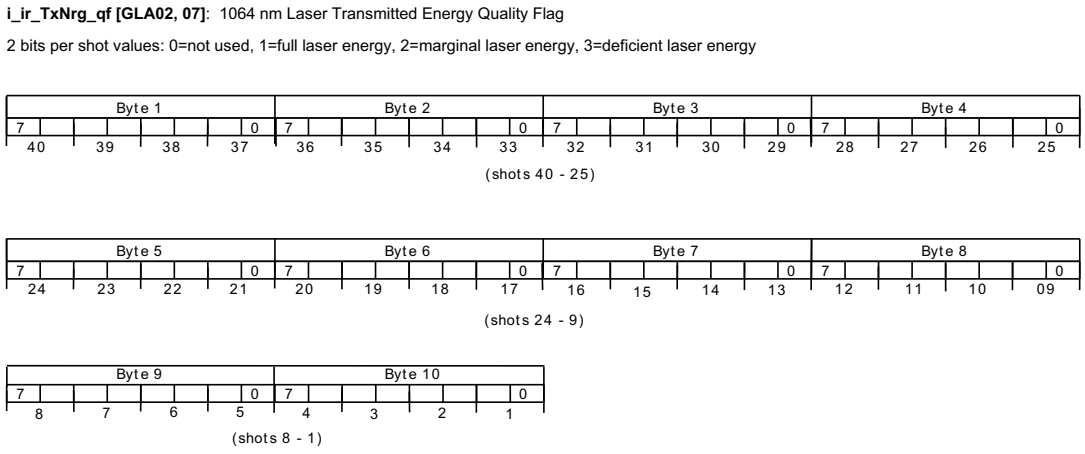


Figure 5-16 1064 nm Laser Transmitted Energy Quality Flag

i1_g_sat_f [GLA02]: Bit flag indicating whether the 532 nm signal is saturated or not for the 40 to 20 KM Segment. 1 bit per each sum of 40 shots per bin (268); 0 = not saturated, 1 = saturated.

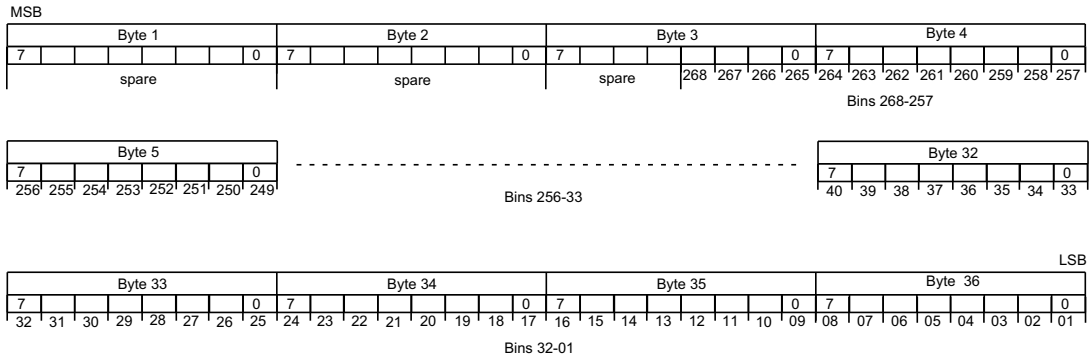


Figure 5-17 Bit flag indicating whether the 532 nm signal is saturated or not for the 40 to 20 KM Segment

i5_g_sat_f [GLA02]: Bit flag indicating whether the 532 nm signal is saturated or not for the 20 to 10 KM Segment. 1 bit per each sum of 8 shot(40) per bin (132); 0 = not saturated, 1 = saturated.

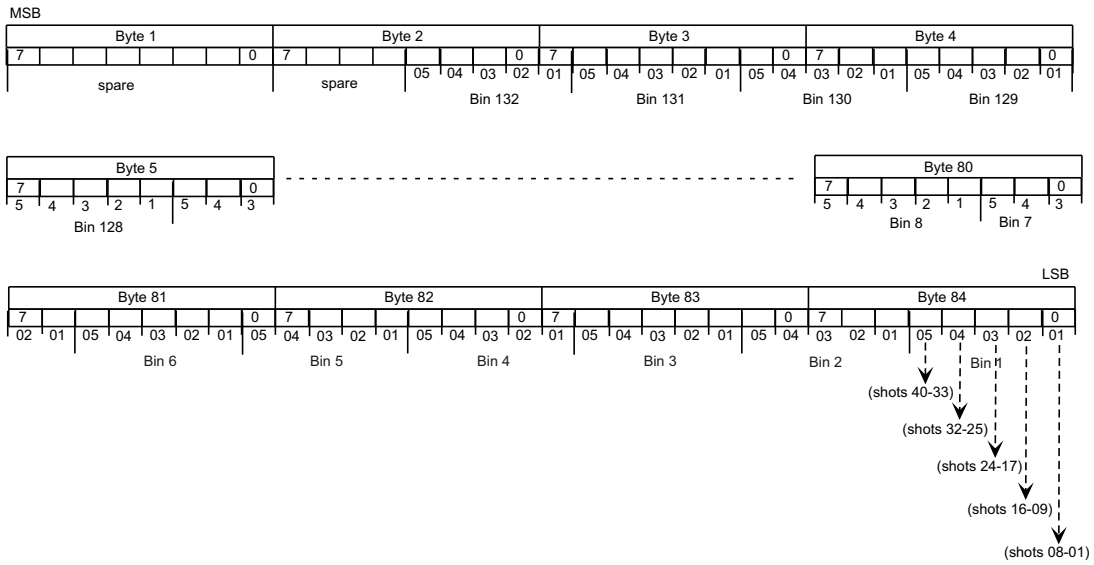


Figure 5-18 Bit flag indicating whether the 532 nm signal is saturated or not for the 20 to 10 KM Segment

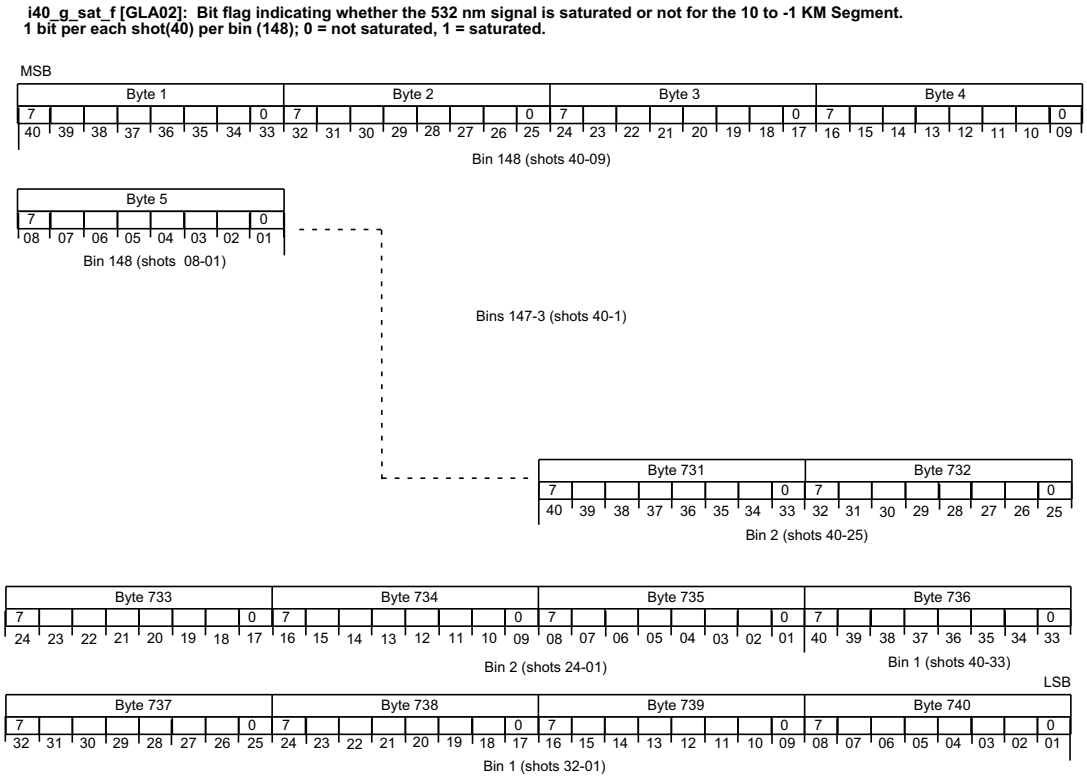


Figure 5-19 Bit flag indicating whether the 532 nm signal is saturated or not for the 10 to -1 KM Segment

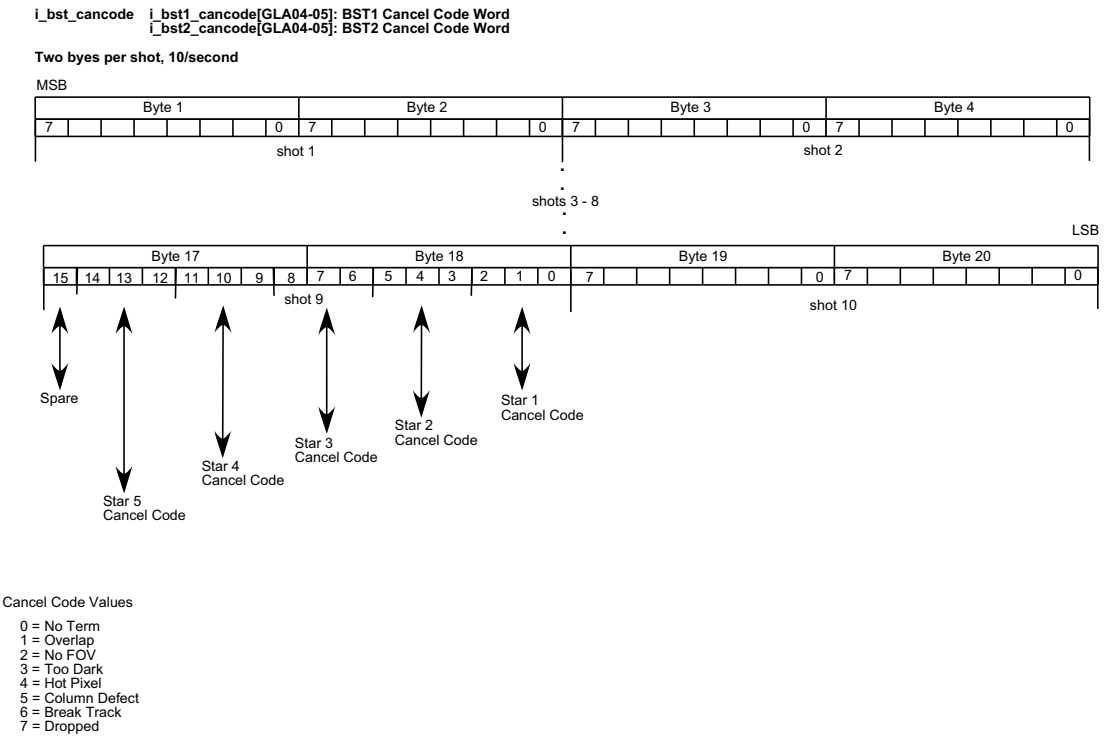


Figure 5-20 BST1 Cancel Code Word BST2 Cancel Code Word

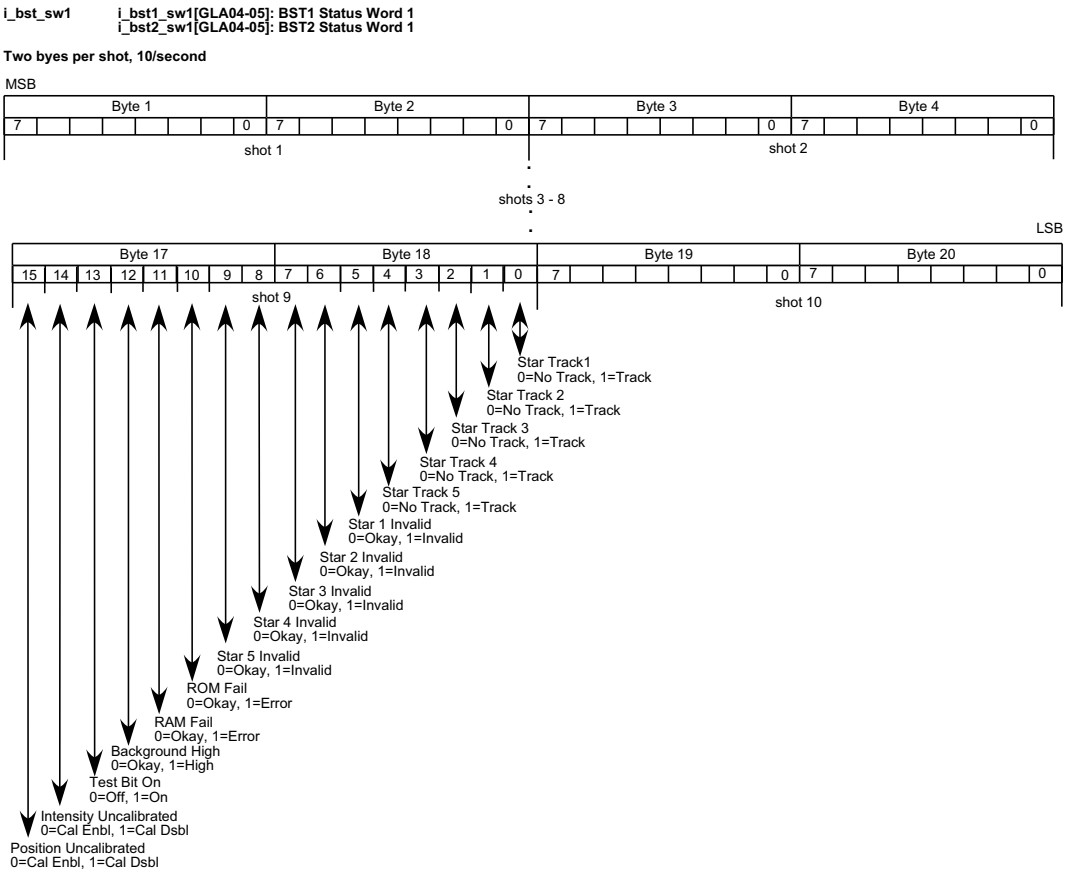


Figure 5-21 BST1 Status Word BST2 Status Word 1

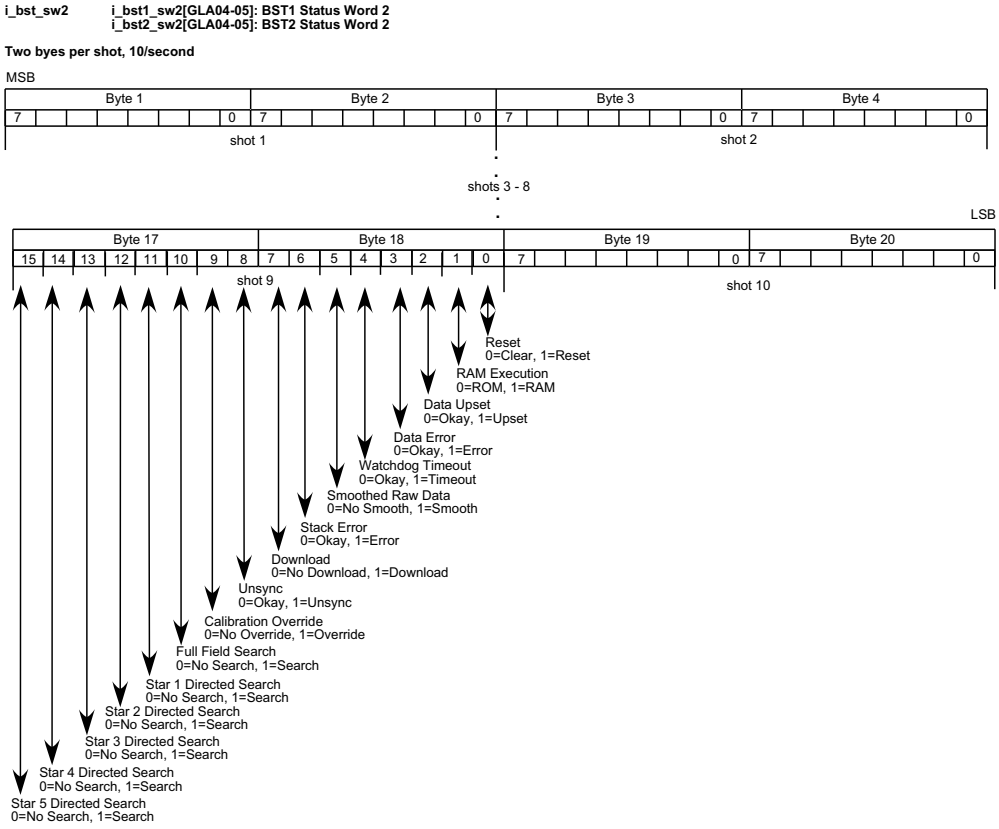


Figure 5-22 BST1 Status Word 2 BST2 Status Word 2

i_ist_flag [GLA04-04]: IST Flag

1 byte flag, 10/second

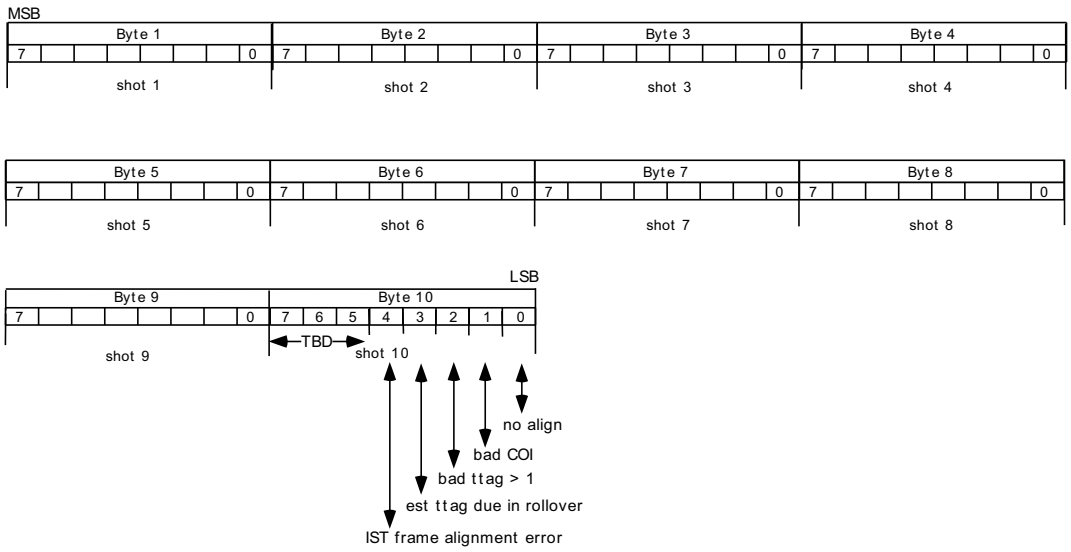


Figure 5-23 IST Flag

i_lrs_flag [GLA04-02]: LRS Flag

1 byte flag, 10/second

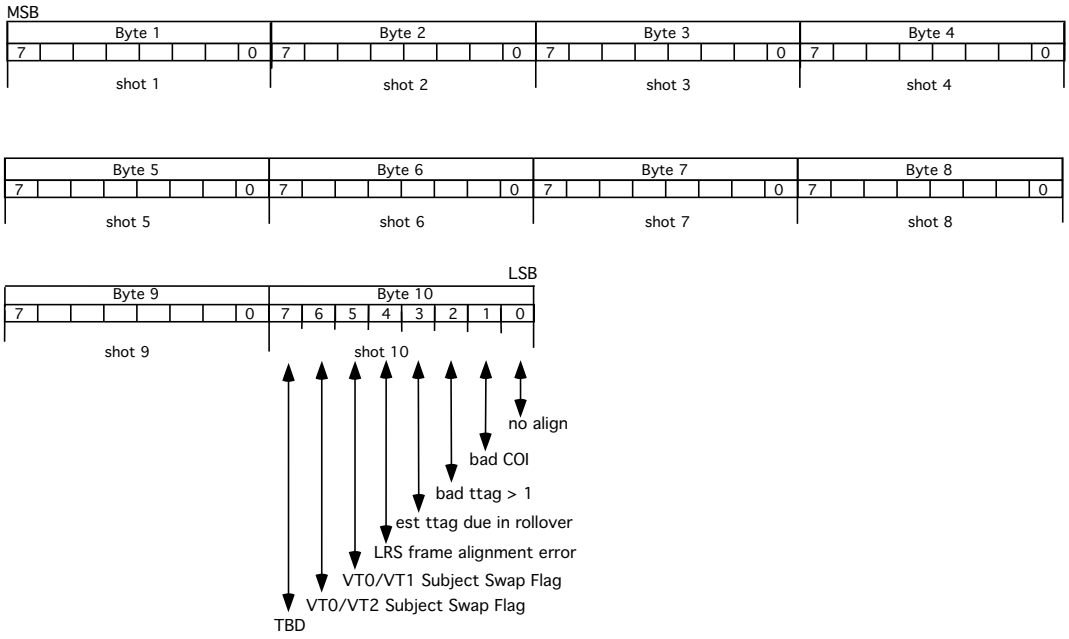


Figure 5-24 LRS Flag

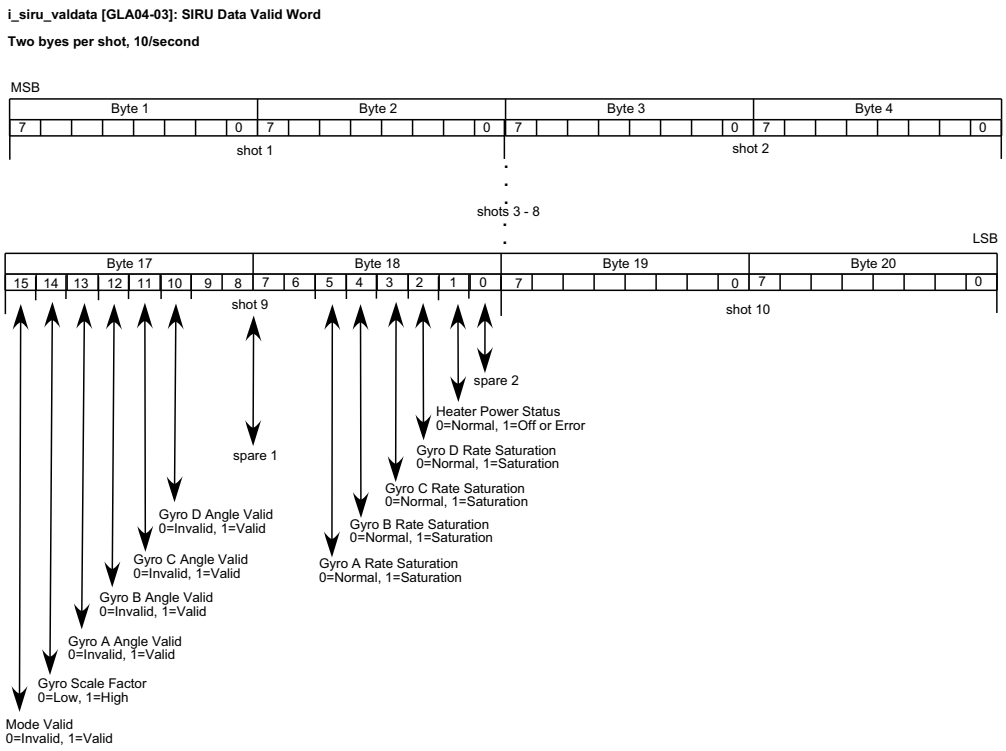


Figure 5-25 SIRU Data Valid Word

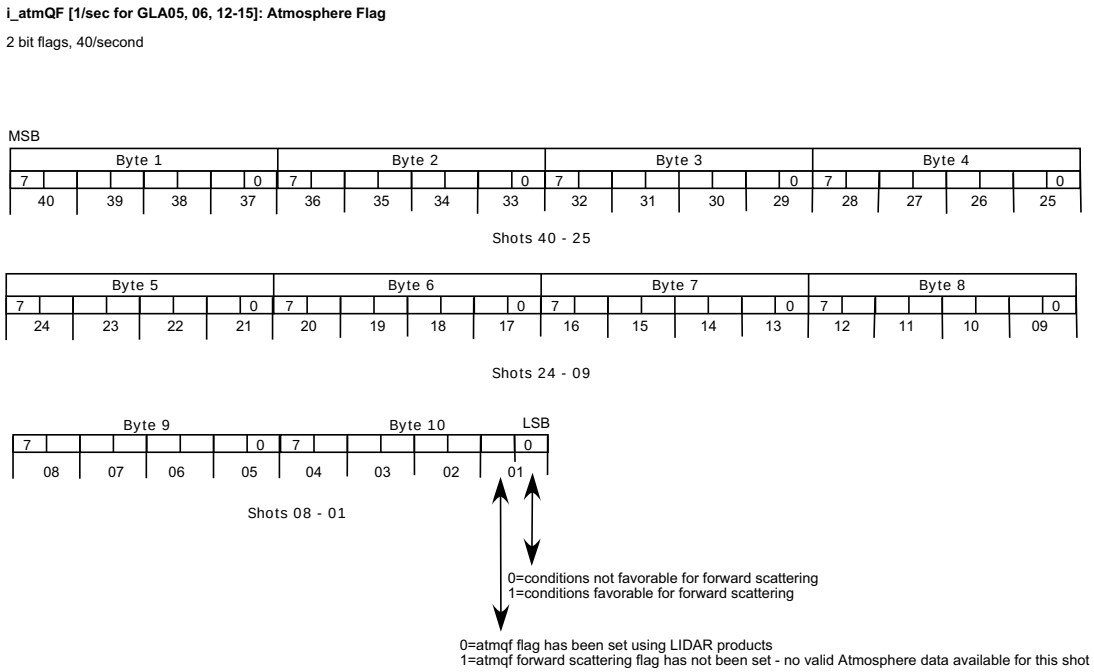


Figure 5-26 Atmosphere Flag

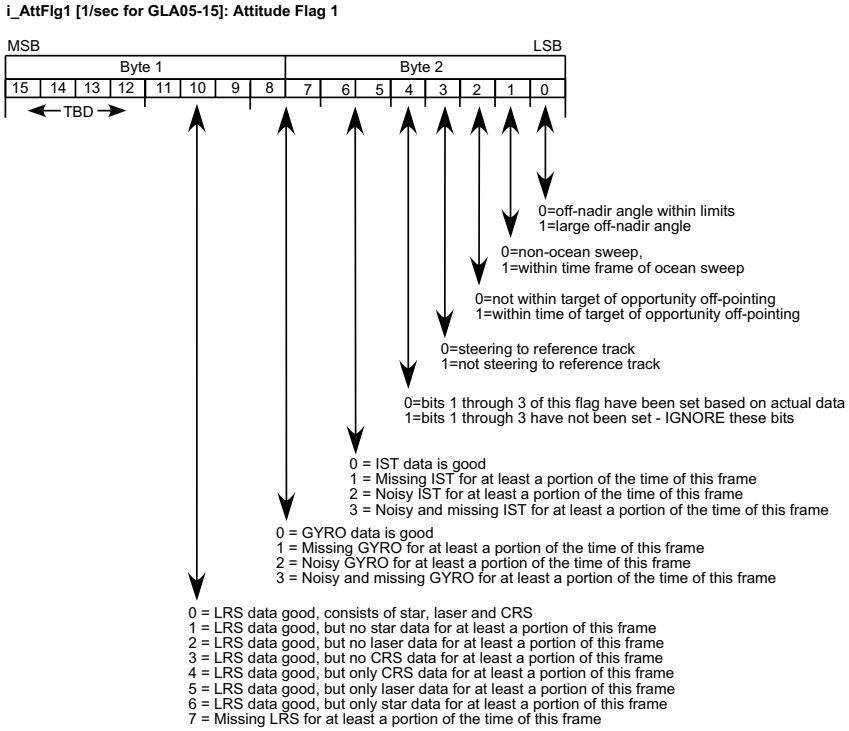


Figure 5-27 Attitude Flag 1

i_AttFlg2 [1/sec for GLA05,06,12-15]: Attitude Flag 2

Bytes 1-5, PAD Use Flag: 1 bit/shot values; 0 = PAD used to determine spot location, 1 = PAD not used to determine spot location
Bytes 6-10, Calc PAD Use Flag: 1 bit/shot values; 0 = new PAD used to determine orbit, 1 = pass-thru PAD not used to determine orbit
Bytes 11-20, LPA Problem Flag: 2 bit/shot values; 0 = no problems with LPA, 1 = missing LPA, 2 = noisy LPA

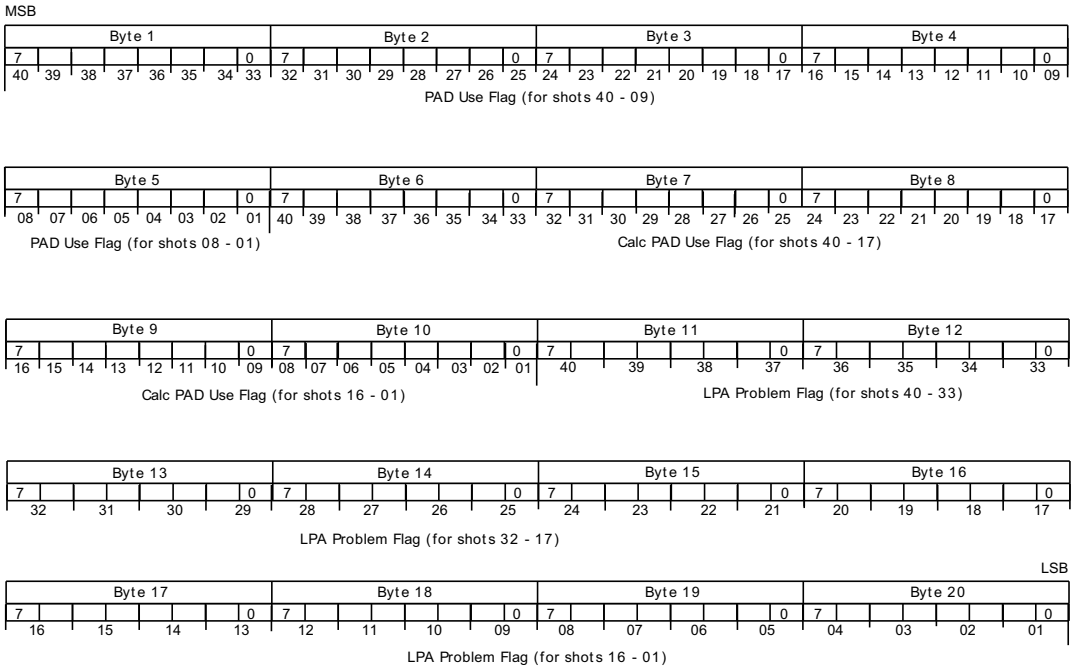


Figure 5-28 Attitude Flag 2

i_AttFlg3 [1/sec for GLA07-11]: Attitude Flag 3

0=PAD used for geolocation
1=PAD not used for geolocation

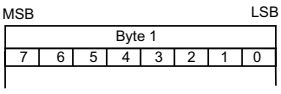


Figure 5-29 Attitude Flag 3

i_ElvFlg [1/sec GLA05, 06, 12-15]: Elevation Definition Flag; Indicates which location on the received echo was used to calculate the elevation on the record.

1-byte flags, 40/second.

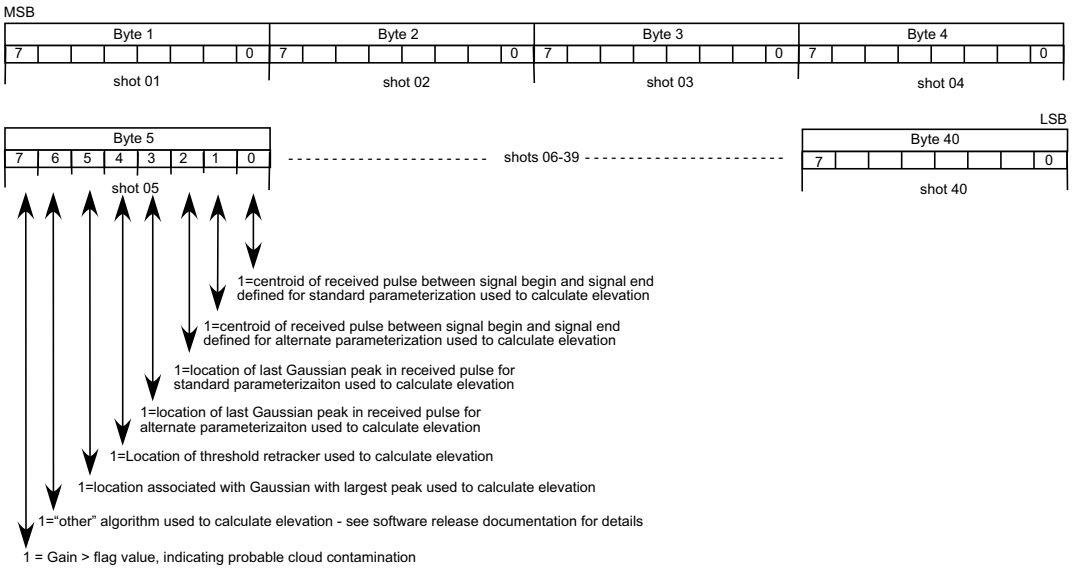


Figure 5-30 Elevation Definition Flag

i_ElvuseFlg [1/sec for GLA05, 06, 12-15]: Elevation Use Flag; One flag per shot; indicates quality to use based on valid or invalid criteria
1-bit flags, 40/second.

0=elevation is valid
1=elevation is invalid

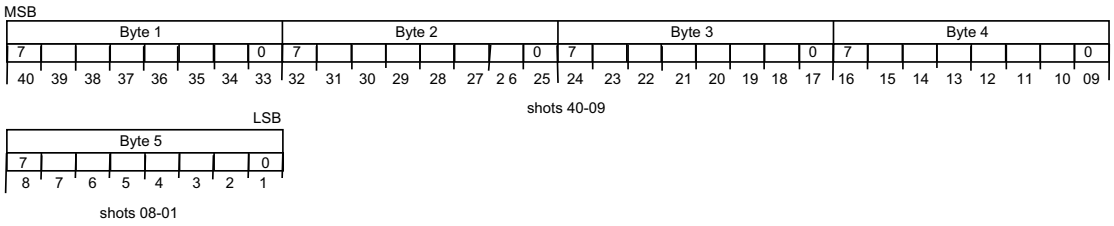


Figure 5-31 Elevation Use Flag

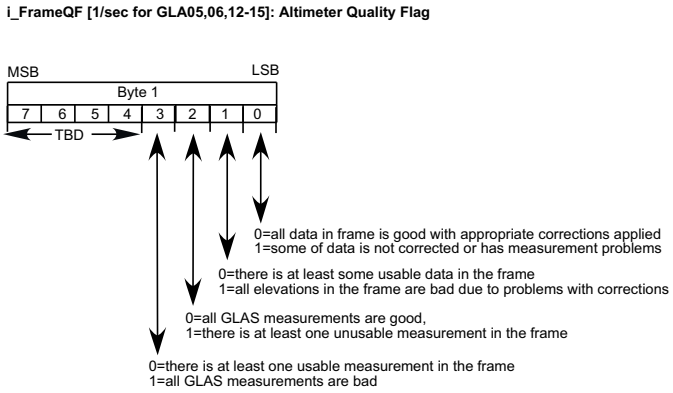


Figure 5-32 Altimeter Quality Flag

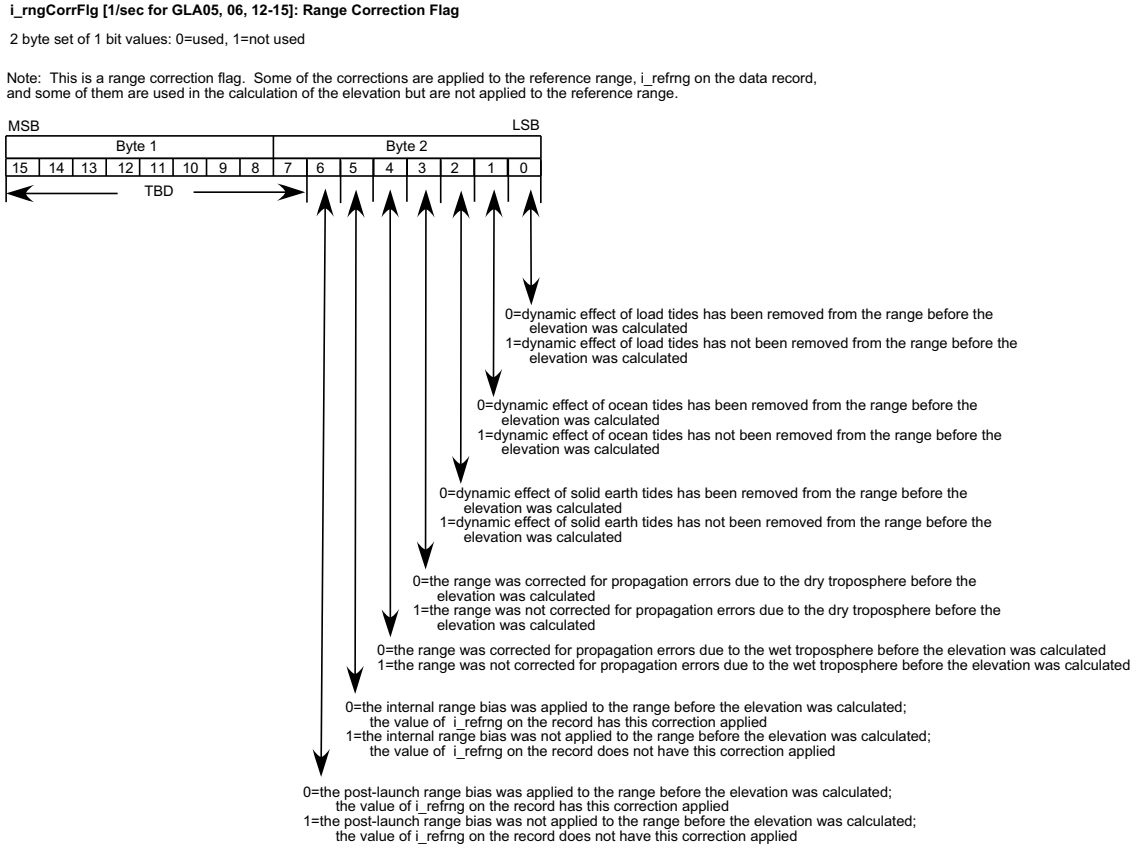
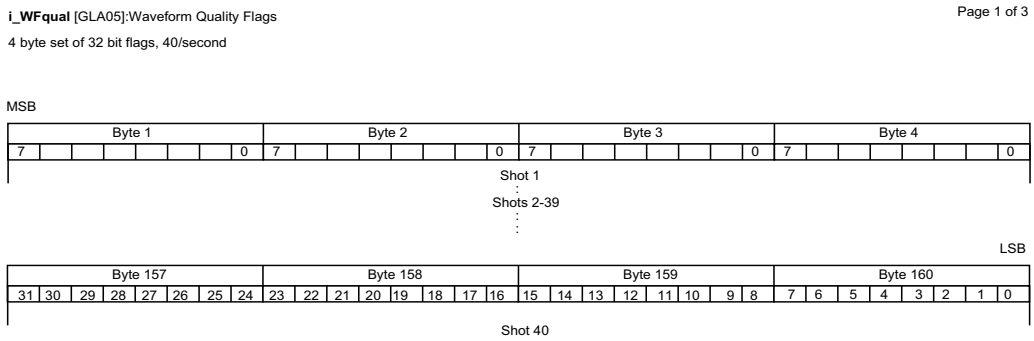


Figure 5-33 Range Correction Flag



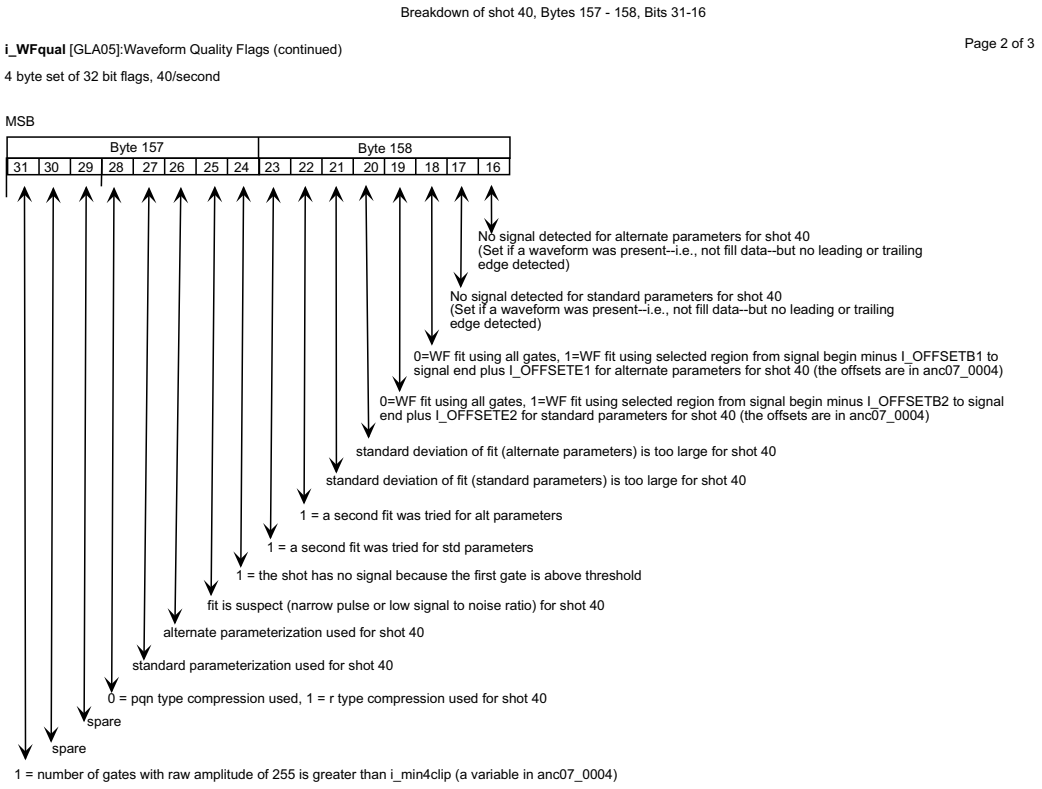


Figure 5-34 Waveform Quality Flags

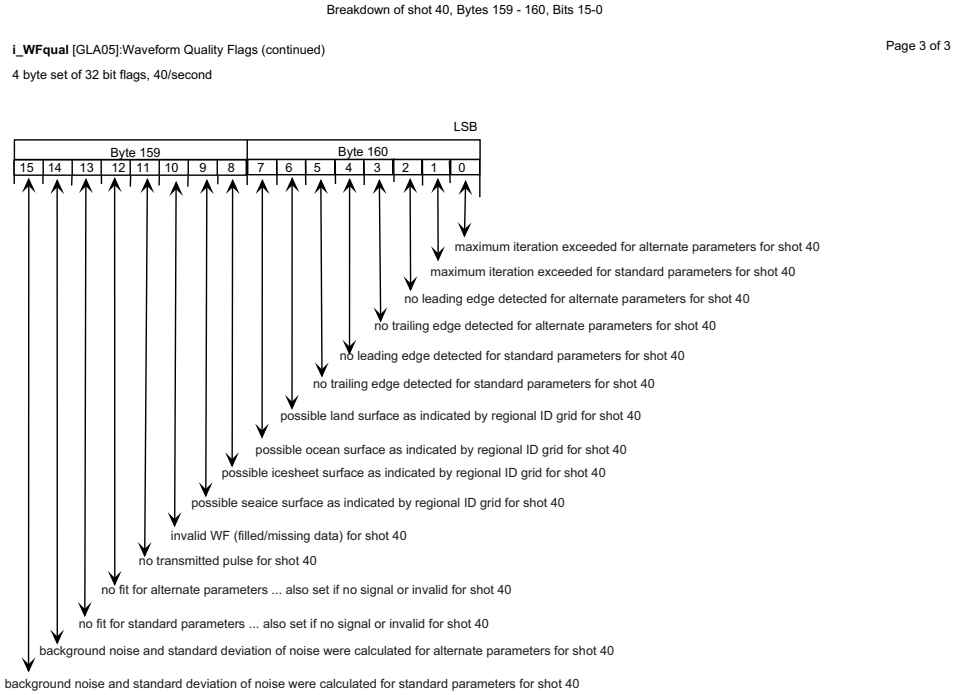


Figure 5-34 Waveform Quality Flags (Continued)

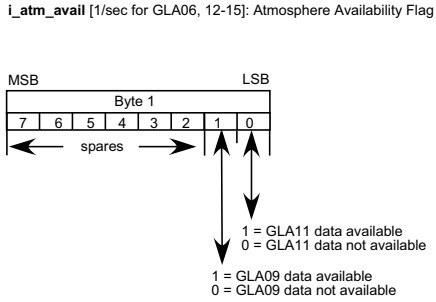
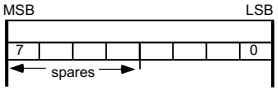


Figure 5-35 Atmosphere Availability Flag

i_cld1_mswf [GLA06, 12-15]: Multiple Scattering Warning Flag

4 bit set of values;
0 = < 0.010
1 = 0.010 - 0.030
2 = 0.030 - 0.060
3 = 0.060 - 0.100
4 = 0.100 - 0.150
5 = 0.150 - 0.225
6 = 0.225 - 0.300
7 = 0.300 - 0.400
8 = 0.400 - 0.500
9 = 0.500 - 0.670
10 = 0.670 - 0.900
11 = 0.900 - 1.200
12 = 1.200 - 1.600
13 = 1.600 - 2.000
14 = > 2.000
15 = Invalid



Note: A warning flag value of 15 will be the default whenever no 532nm signal is available (as when the 532 laser energy is < 4 mJ during daytime). To distinguish this case from that of optically thick clouds, one must check the number of layers. If there were zero layers reported, but the MSWF is 15, then the cause is the lack of useable 532 data. If the number of layers is > 0 and the MSWF is 15, then the cause is total extinction of the lidar beam (this happens for clouds of optical depth > about 3).

A warning flag of '0' is a very good indicator of no layers or a layer so thin it won't cause any altimetry range delays.

Figure 5-36 Multiple Scattering Warning Flag

i_CorrStatFlg [1/sec for GLA06, 12-15]: Correction Status Flag

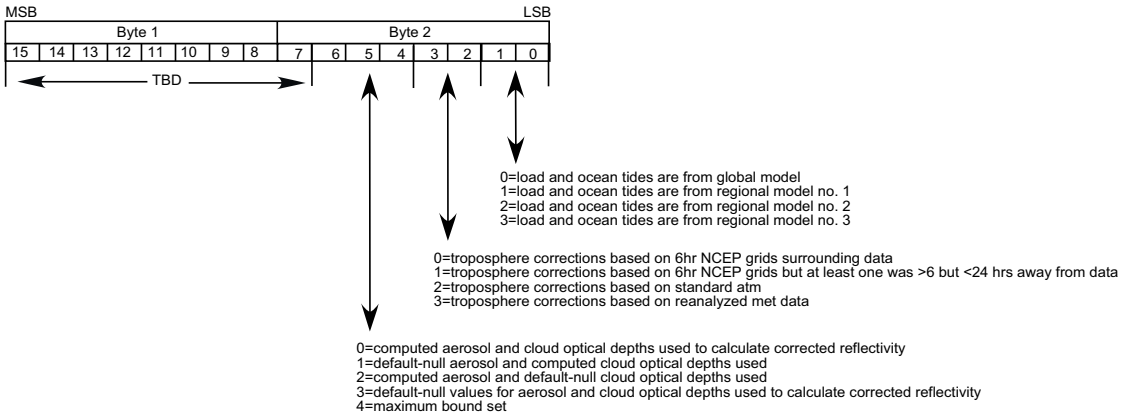
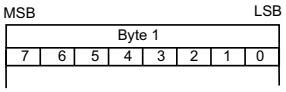


Figure 5-37 Correction Status Flag

i_DEM_hires_src [1/sec for GLA06,12-14]: High Resolution Source Flag

1-byte flag, 40/second



Values:

0 = no high res source available
1 = “unfinished research” Shuttle Radar Topography Mission (SRTM)
C-band 90 m DEM produced by JPL (+-1.1km E-W swath)
2 = “finished” SRTM C-band 90 m DEM produced by NGA (+-2.1km E-W swath)
3 = ICESat Greenland V1 1km DEM
4 = ICESat Antarctica V1 500m DEM
5 = 90m Canadian Digital Elevation Data (CDED)
6 = 90m Canadian Digital Elevation Data (CDED) if available otherwise “finished” SRTM C-band 90 m DEM

Figure 5-38 High Resolution Source Flag

i_MRC_af [GLA06, 12-15]: Medium Resolution Cloud Availability Flag

af = availability flag (extracted from the af bits of i_MRCL_flag on GLA09): Tells how many cloud layers were found at this resolution from the 532 nm channel. Value 15 = cloud layers were not searched for; value 0 = cloud layers were searched for, but not detected. Rate is once per second.

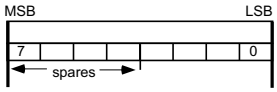


Figure 5-39 Medium Resolution Cloud Availability Flag

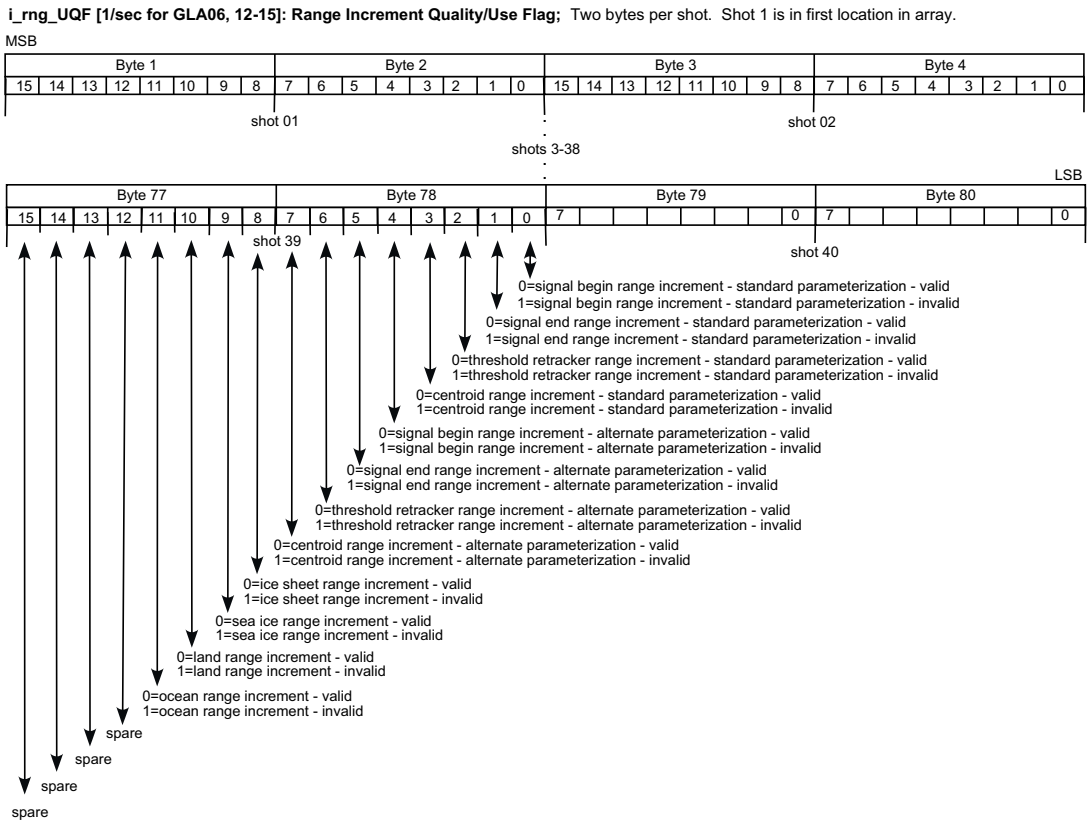


Figure 5-40 Range Increment Quality/Use Flag

i_SurfRuf_slpQF [1/sec for GLA06, 12,14]: Surface Roughness and Slope Quality Flag; One byte per shot data quality flag.

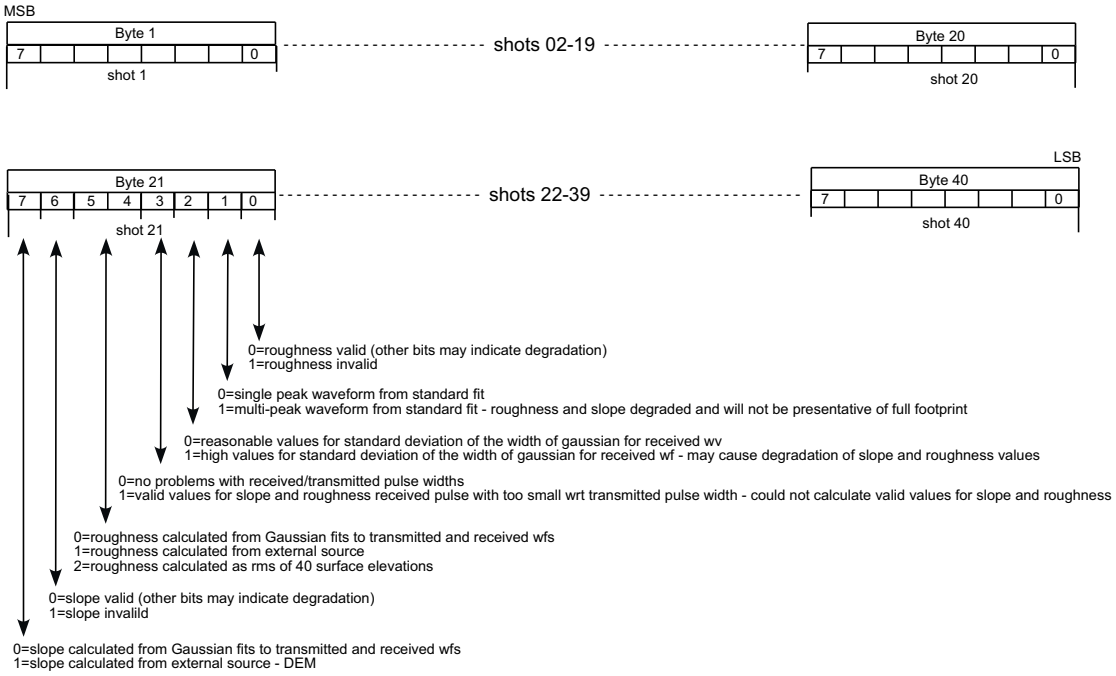


Figure 5-41 Surface Roughness and Slope Quality Flag

i_surfType [GLA06, 12-15]: Region Type
1 byte of 1 bit values

Note: Multiple surface type bits may be set for a given location. i.e. Land and Ice Sheet bits are set for any grounded ice.

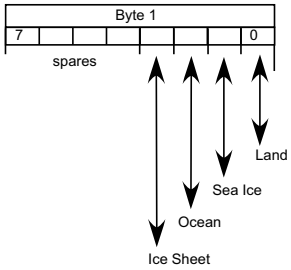


Figure 5-42 Region Type

i_LidarQF [1/sec for GLA07], [1/4 sec for GLA08-11]: Lidar Frame Quality Flag

0=good data
1=data unsuitable for L2 processing due to weak 532 laser energy or high background
2=either SPCMs not turned on or bad background

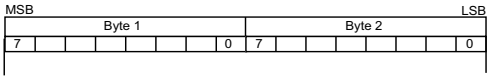


Figure 5-43 Lidar Frame Quality Flag

i_532AttBS_Flag [GLA07]: 532 nm Attenuated Backscatter Vertical Profile Flag

i40_g_bscs_uf = use flag at 40Hz: value 0 = no, saturated bins were replaced; value 1 = yes, saturated bins were replaced

i40_g_bscs_qf = quality flag at 40Hz: value 0 = good data; value 1 = if 532 nm laser energy flag equals 3; value 2 = if 1064 nm quality flag equals 1 and 1064 nm backscatter value replaced 532 nm backscatter value

i5_g_bscs_uf = use flag at 5Hz: value 0 = no, saturated bins were replaced; value 1 = yes, saturated bins were replaced

i5_g_bscs_qf = quality flag at 5Hz: value 0 = good data; value 1 = if 532 nm laser energy flag equals 3; value 2 = if 1064 nm quality flag equals 1 and 1064 nm backscatter value replaced 532 nm backscatter value

il_g_bscs_qf = quality flag at 1 sec: value 0 = good quality; value 2 = 532 nm integrated return is bad; value 3 = ratio of integrated return to molecular integrated return is bad

i_g_cal_qf = quality flag: value 0 = good quality; value 2 = if no records left after elimination tests, value before elimination tests used instead

i_g_cal_dnf = day/night flag: value 0 = indeterminate; value 1 = night; value 2 = day

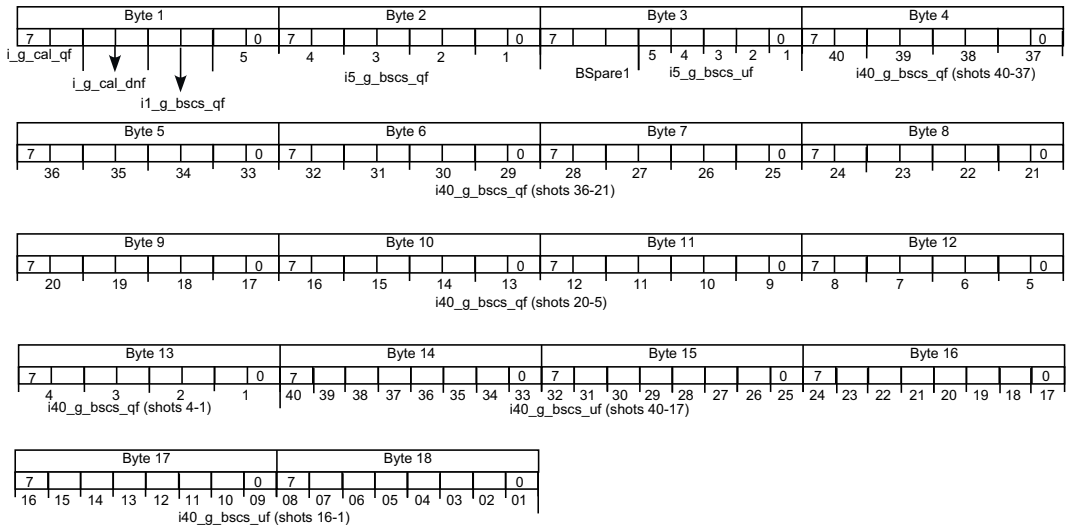


Figure 5-44 532 nm Attenuated Backscatter Vertical Profile Flag

i_1064AttBS_Flag [GLA07]: 1064 nm Attenuated Backscatter Vertical Profile Flag

i40_ir_bscs_uf = use flag: not used

i40_ir_bscs_qf = quality flag at 40Hz: value 0 = good data; value 1 = if 1064 nm laser energy flag equals 3

i5_ir_bscs_uf = use flag: not used

i5_ir_bscs_qf = quality flag at 5Hz: value 0 = good data; value 1 = if 1064 nm laser energy flag equals 3

i1_ir_cal_qf = quality flag: value 0 = good quality; value 2 = if no records left after elimination tests, value before elimination tests used instead

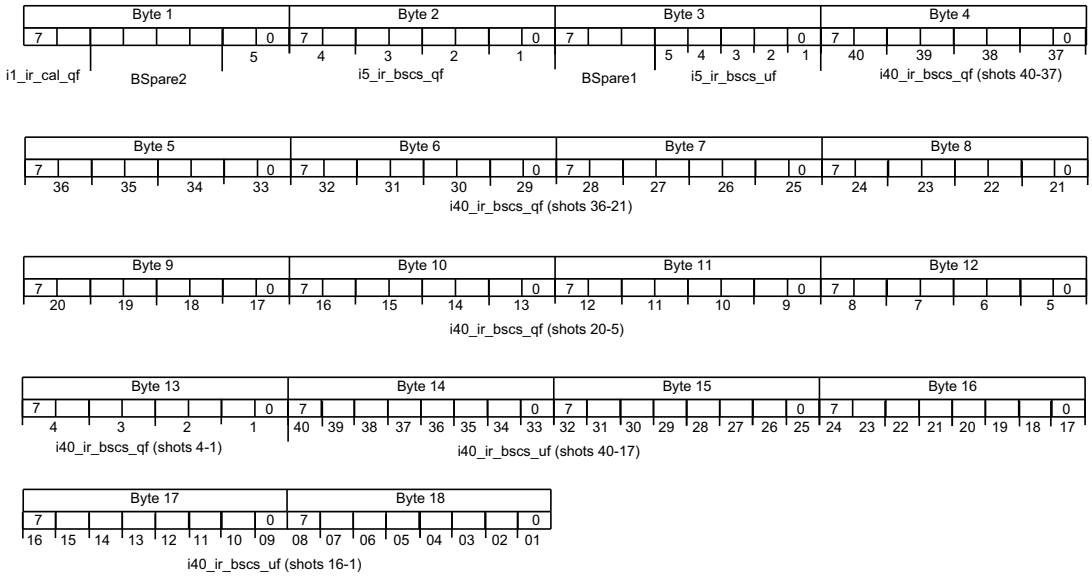


Figure 5-45 1064 nm Attenuated Backscatter Vertical Profile Flag

i_metFlg [GLA07]: Meteorological/Standard Atmospheric Data Source/Quality Flag

The met data used by the atmospheric processing routines normally consists of 2 global gridded data sets, one before the GLAS observation time and one after. They are both normally within 6 hours of the GLAS observation time. A check is made on the time of the MET files and if either one is > 24 hours from the GLAS observation time, it is not used. If both files are not used, then the standard atmosphere data is according to the latitude and season.

Met Data Source:

0 : use both met files
1 : use first met file
2 : use second met file
3 : use standard atmosphere, arctic summer
4 : use standard atmosphere, arctic winter
5 : use standard atmosphere, midlatitude summer
6 : use standard atmosphere, midlatitude winter
7 : use standard atmosphere, tropical

The quality flag is not used at this time.

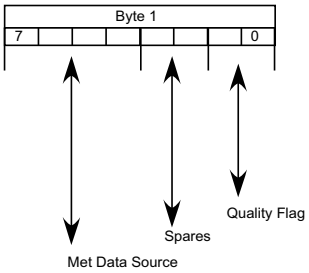


Figure 5-46 Meteorological/Standard Atmospheric Data Source/Quality Flag

i5_g_sat_prof [GLA07]: 532 nm Saturation Flag Profile 40 to -1km. Indicates whether the 532 data were saturated and therefore whether the value is converted from the 1064 data.

1 bit per each shot(40) per bin (548); 0 = not saturated, 1 = saturated.

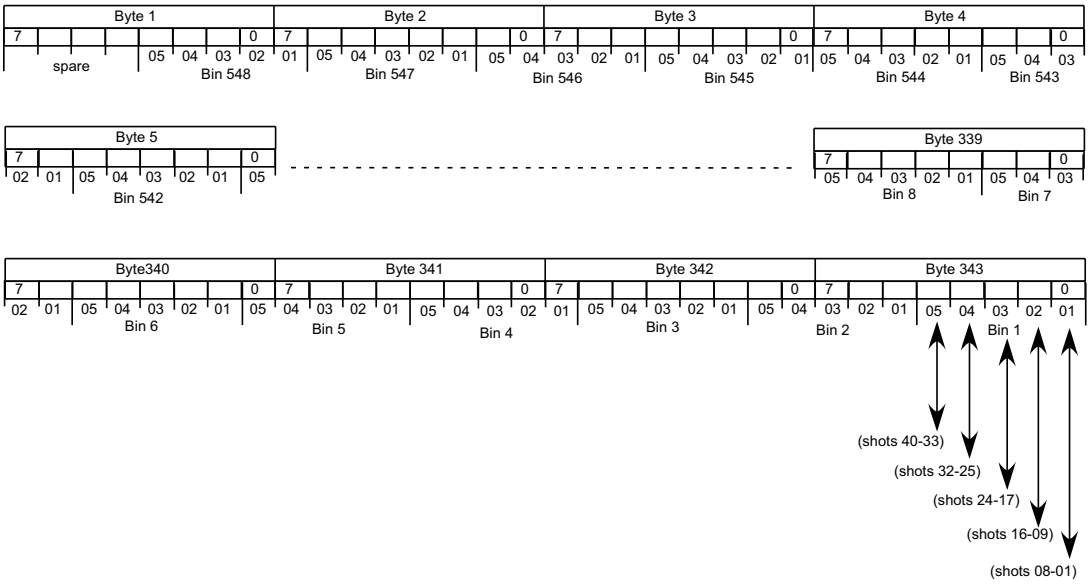


Figure 5-47 532 nm Saturation Flag Profile 40 to -1km

i40_g_sat_prof [GLA07]: 532 nm Saturation Flag Profile 10 to -1km. Indicates whether the 532 data were saturated and therefore whether the value is converted from the 1064 data.

1 bit per each shot(40) per bin (148); 0 = not saturated, 1 = saturated.

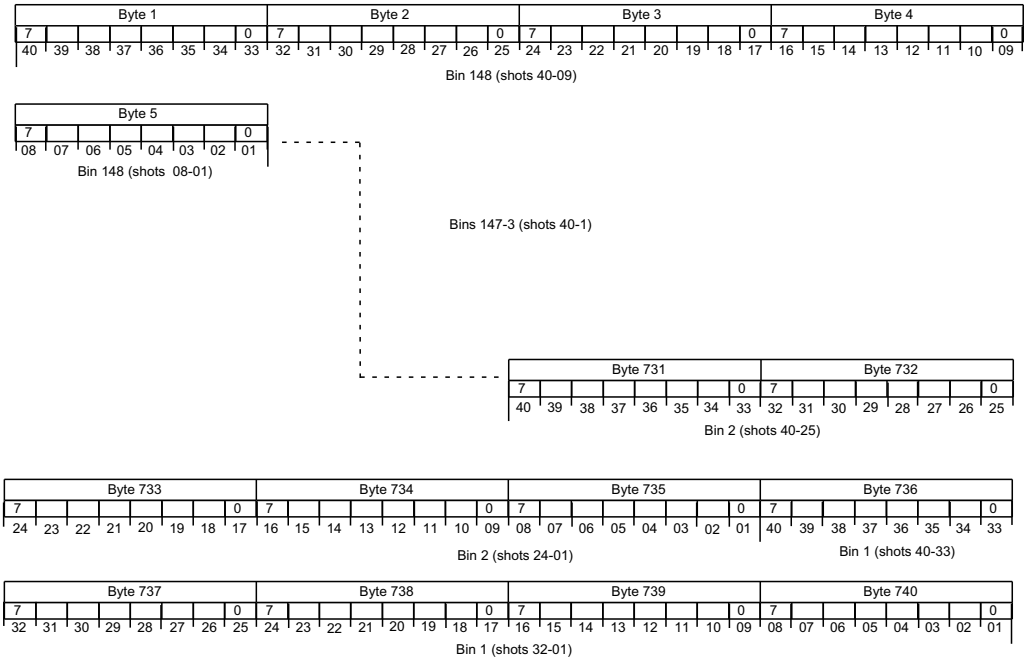


Figure 5-48 532 nm Saturation Flag Profile 10 to -1km

i_Aer_ir_layflg [GLA08]: Layer Flag for 1064 Aerosol

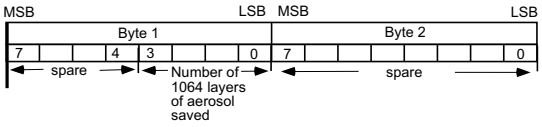


Figure 5-49 Layer Flag for 1064 Aerosol

i_LayHgt_Flag [GLA08]: Layer Height Flag Page 1 of 2

i_pscf: value 0 = not a Polar Stratospheric Cloud (PSC); value 1 = low likely; value 2 = medium likely; value 3 = high likely

i20_aer_qf = quality flag at 1 per 20 sec: value 0 = aerosol layers were searched for, but not detected; values 1 to 13 = increasing goodness; value 14 = bad; value 15 = upper (>20 km) aerosol layers were not searched for

i20_aer_af = availability flag at 1 per 20 sec: Contains the number of aerosol layers found above 20 km from a 20 second average of the data. Value 0 = aerosol layers were searched for, but not detected; value 15 = aerosol layers were not searched for.

i20_aer_uf = use flag at 1 per 20 sec: value 0 = no saturated bins present in layer; value 1 = saturated bins present in layer and replaced with 1064 data; value 2 = saturated bins present in layer and not replaced with 1064 data

i4_aer_qf = quality flag at 1 per 4 sec: value 0 = aerosol layers were searched for, but not detected; values 1 to 13 = increasing goodness; value 14 = bad; value 15 = lower (<20 km) aerosol layers were not searched for

i4_aer_af = availability flag at 1 per 4 sec: Contains the number of elevated (excluding PBL) aerosol layers found below 20 km from a 4 second average of the data. Value 0 = aerosol layers were searched for, but not detected; value 15 = aerosol layers were not searched for.

i4_aer_uf = use flag at 1 per 4 sec: value 0 = no saturated bins present in layer; value 1 = saturated bins present in layer and replaced with 1064 data; value 2 = saturated bins present in layer and not replaced with 1064 data

i_HRpbl_qf = quality flag at 5Hz for 4 sec: value 0 = PBL was searched for, but not detected; values 1 to 13 = increasing goodness; value 14 = bad; value 15 = PBL not searched for

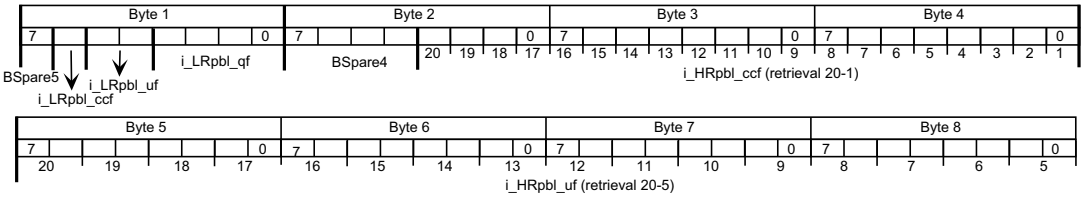
i_HRpbl_uf = use flag at 5Hz for 4 sec: value 0 = no saturated bins present in layer; value 1 = saturated bins present in layer and replaced with 1064 data; value 2 = saturated bins present in layer and not replaced with 1064 data

i_HRpbl_ccf = clear/cloudy flag at 5Hz for 4 sec: value 0 = clear; value 1 = cloudy

i_LRpbl_qf = quality flag at 1 per 4 sec: value 0 = PBL was searched for, but not detected; values 1 to 13 = increasing goodness; value 14 = bad; value 15 = PBL not searched for

i_LRpbl_uf = use flag at 1 per 4 sec: value 0 = no saturated bins present in layer; value 1 = saturated bins present in layer and replaced with 1064 data; value 2 = saturated bins present in layer and not replaced with 1064 data

i_LRpbl_ccf = clear/cloudy flag at 1 per 4 sec: value 0 = clear; value 1 = cloudy



i_LayHgt_Flag [GLA08]: Layer Height Flag (continued) Page 2 of 2

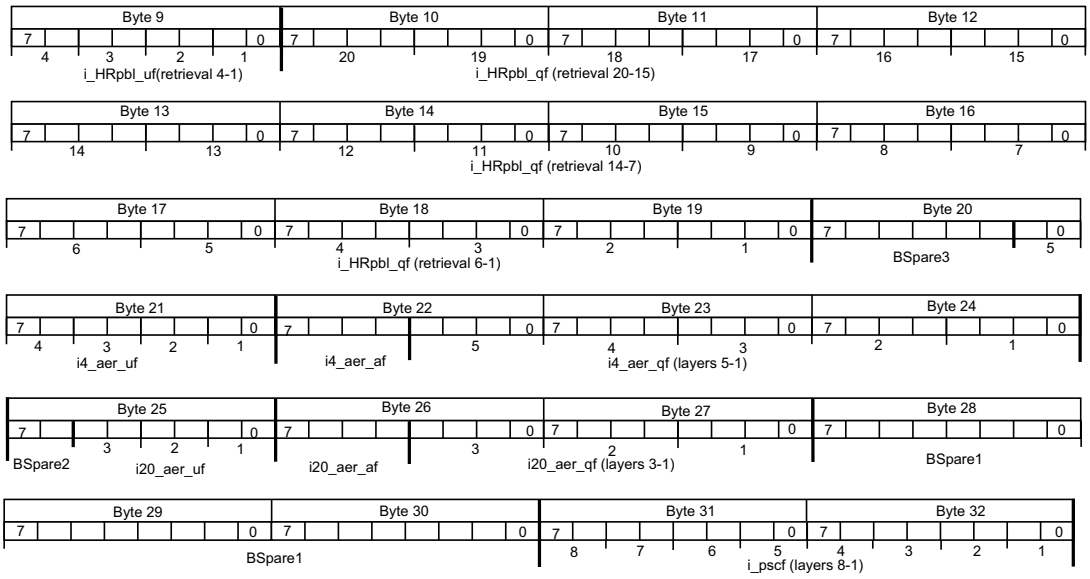


Figure 5-50 Layer Height Flag

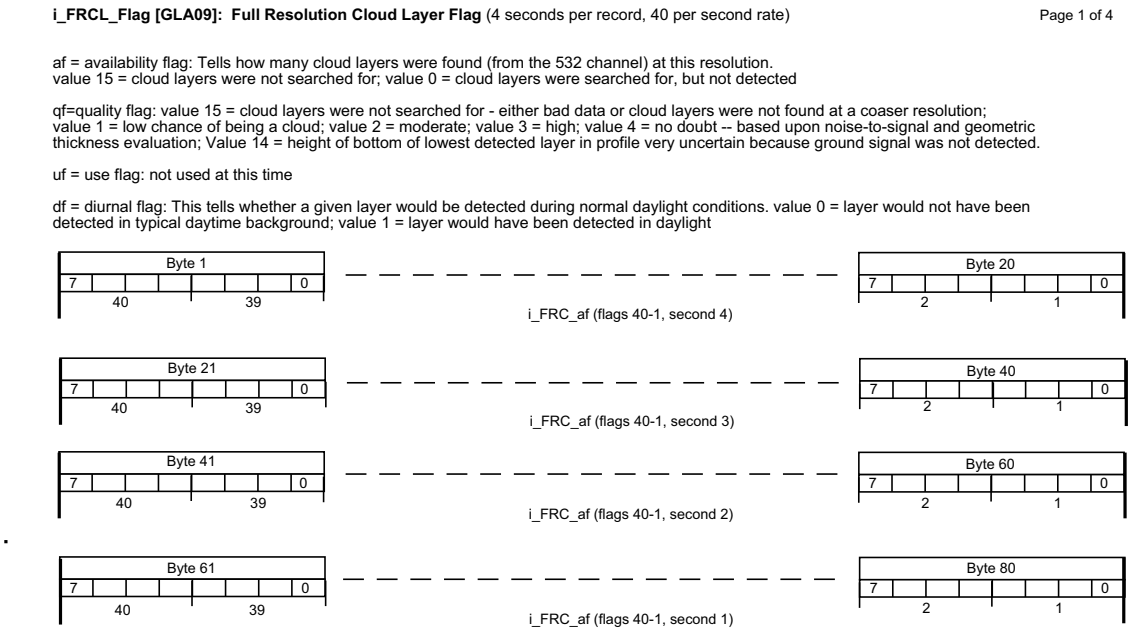


Figure 5-51 Full Resolution Cloud Layer Flag

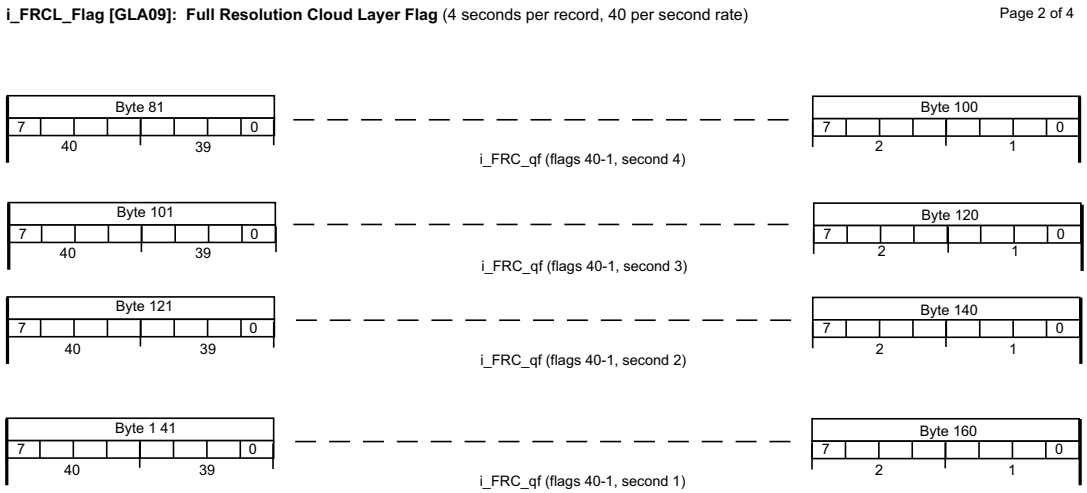


Figure 5-51 Full Resolution Cloud Layer Flag (Continued)

i_FRCL_Flag [GLA09]: Full Resolution Cloud Layer Flag (4 seconds per record, 40 per second rate) Page 3 of 4

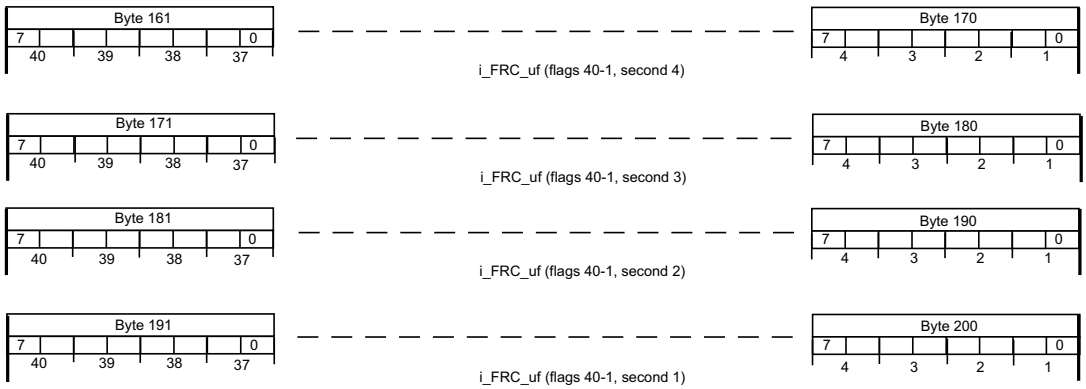


Figure 5-51 Full Resolution Cloud Layer Flag (Continued)

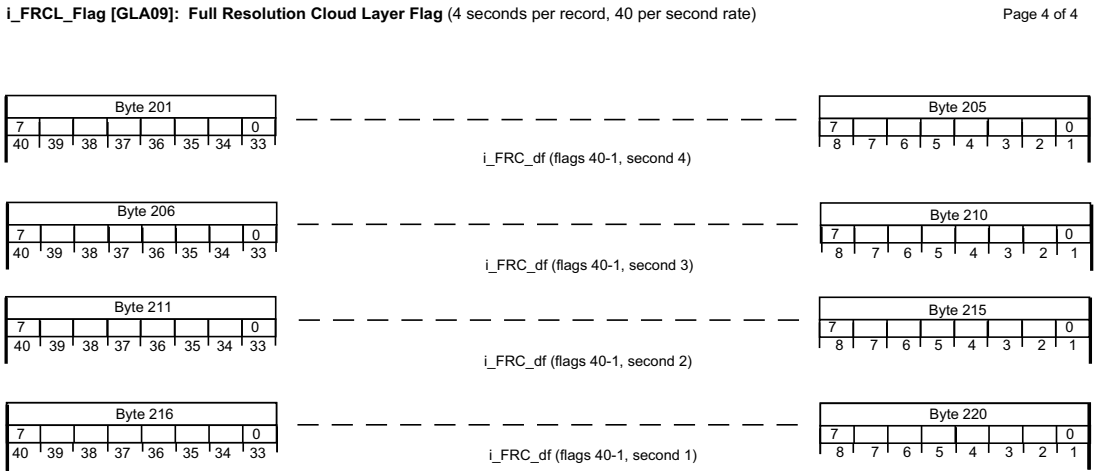


Figure 5-51 Full Resolution Cloud Layer Flag (Continued)

i_FRir_qaFlag [GLA09, 11]: Full Resolution 1064 Quality Flag (i1b(160): 4 seconds per record, 40 per second rate)

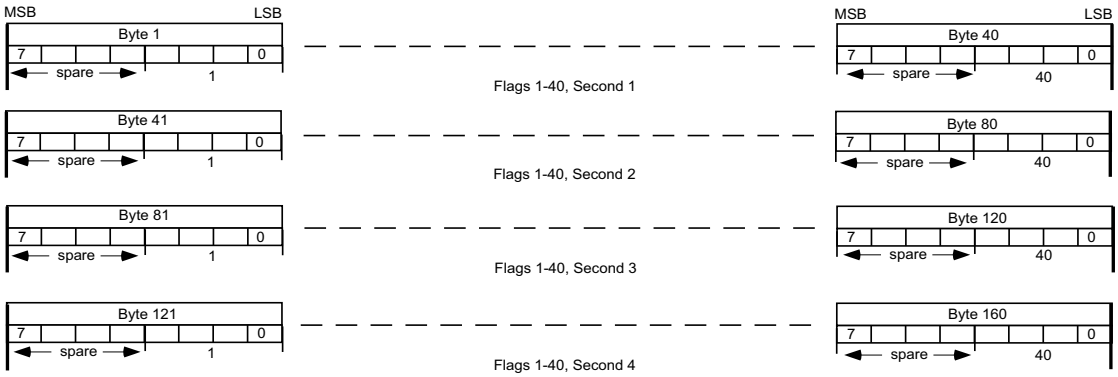
One byte per data quality flag

Value 15 = No clouds.

Value 14 = Indicates the likely presence of low clouds (< 150 m) based on elevated signal from the two bins above the ground return bin that were not detected directly by the cloud search algorithm. When this occurs, the 40 Hz cloud top height (i_Frir_cldtop) is set to a value of 0.10 km.

Value 13 = Indicates the possible presence of a cloud based on the value of the integrated signal parameter (i_FRir_intsig) that was not detected directly by the cloud search algorithm. When this occurs, the 40 Hz cloud top height (i_Frir_cldtop) is set to a value of 10.0 km.

Value 0 - 12 = Cloud detected by cloud search algorithm with higher numbers indicating a stronger average signal from the region starting at cloud top and extending 500 m below cloud top height.



i_FRir_qaFlag [GLA06, 12-15]: Full Resolution 1064 Quality Flag (i1b(40): 40 per second rate)

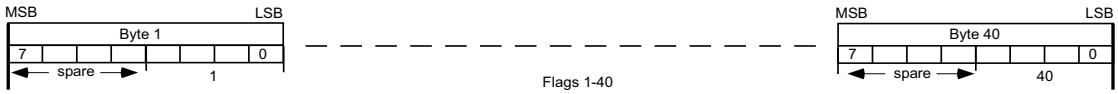


Figure 5-52 Full Resolution 1064 Quality Flag

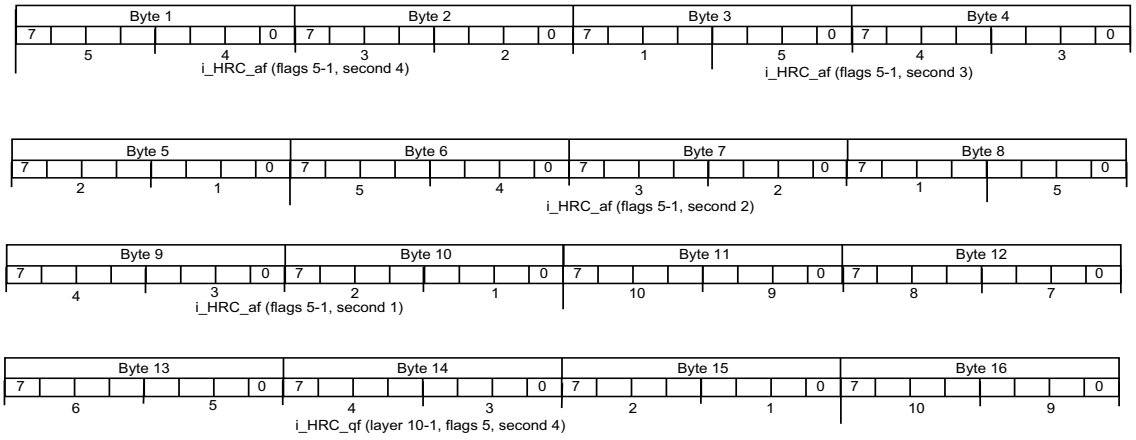
i_HRCL_Flag [GLA09]: High Resolution Cloud Layer Flag (4 seconds per record, 5 per second rate) Page 1 of 7

af = availability flag: Tells how many cloud layers were found (from the 532 channel) at this resolution.
value 15 = cloud layers were not searched for; value 0 = cloud layers were searched for, but not detected

qf=quality flag: value 15 = cloud layers were not searched for - either bad data or cloud layers were not found at a coaser resolution; value 1 = low chance of being a cloud; value 2 = moderate; value 3 = high; value 4 = no doubt -- based upon noise-to-signal and geometric thickness evaluation; Value 14 = height of bottom of lowest detected layer in profile very uncertain because ground signal was not detected.

uf = use flag: not used at this time

df = diurnal flag: This tells whether a given layer would be detected during normal daylight conditions. value 0 = layer would not have been detected in typical daytime background; value 1 = layer would have been detected in daylight



i_HRCL_Flag [GLA09]: High Resolution Cloud Layer Flag (4 seconds per record, 5 per second rate) Page 2 of 7

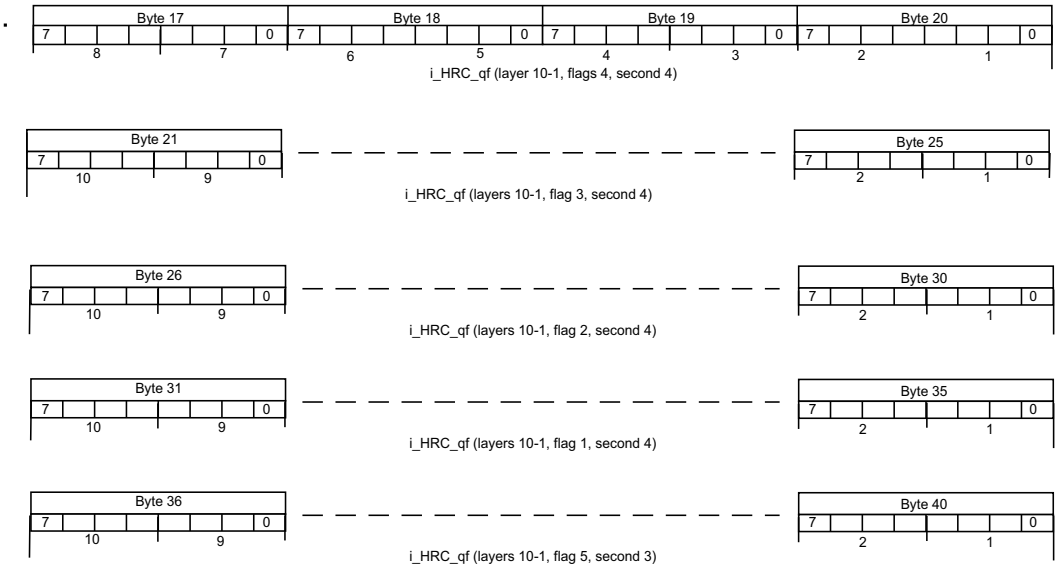


Figure 5-53 High Resolution Cloud Layer Flag

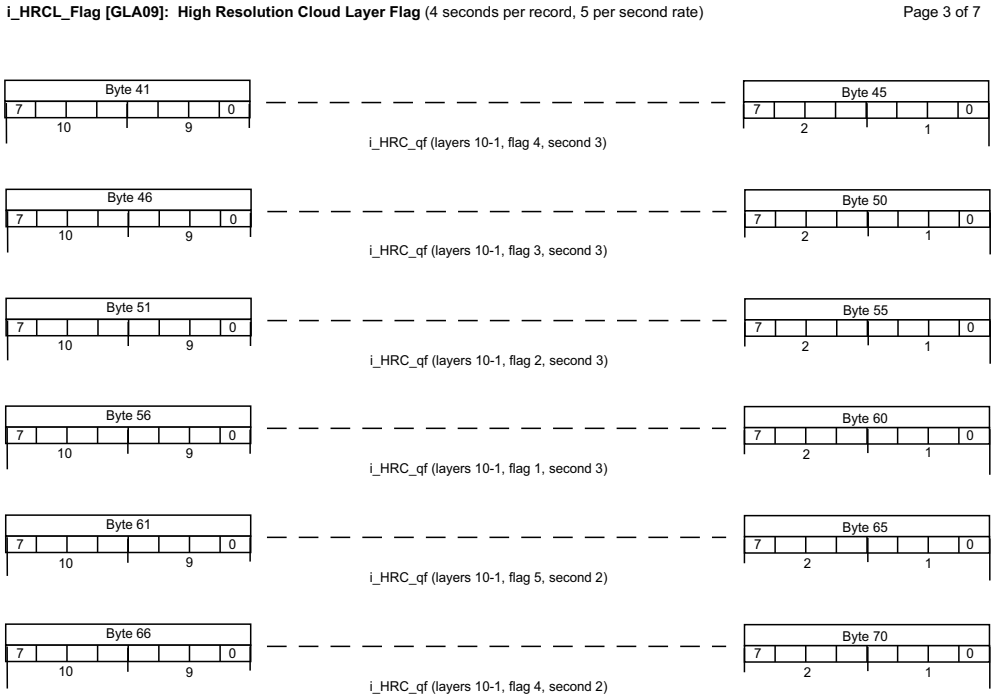


Figure 5-53 High Resolution Cloud Layer Flag (Continued)

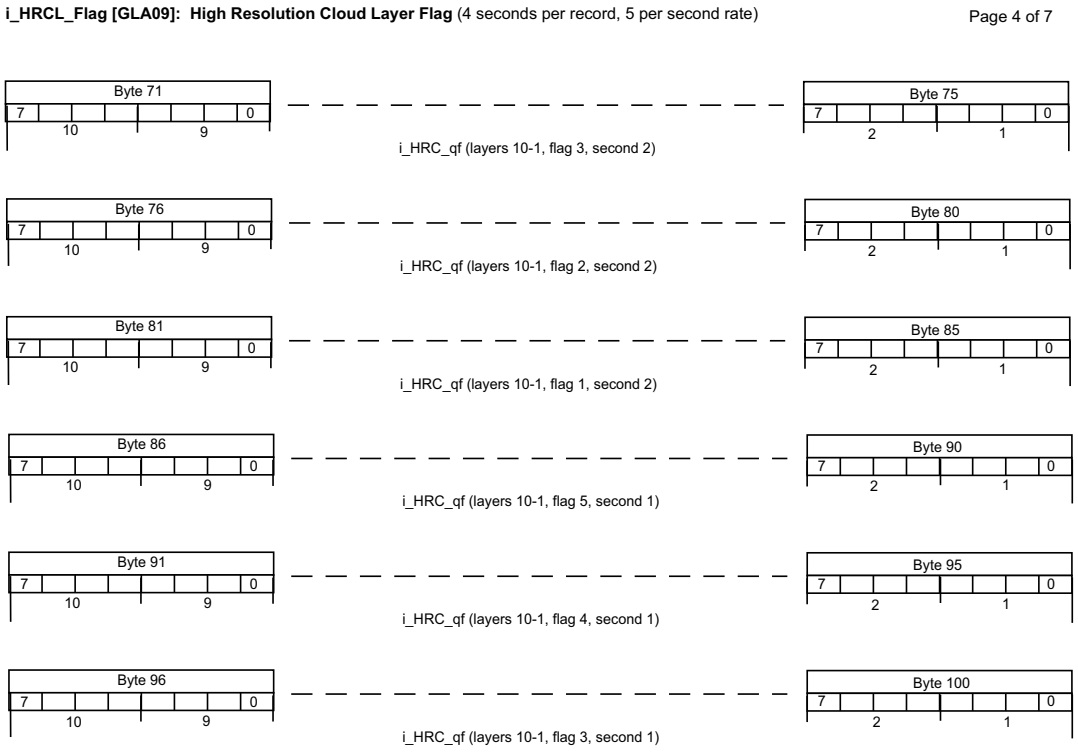


Figure 5-53 High Resolution Cloud Layer Flag (Continued)

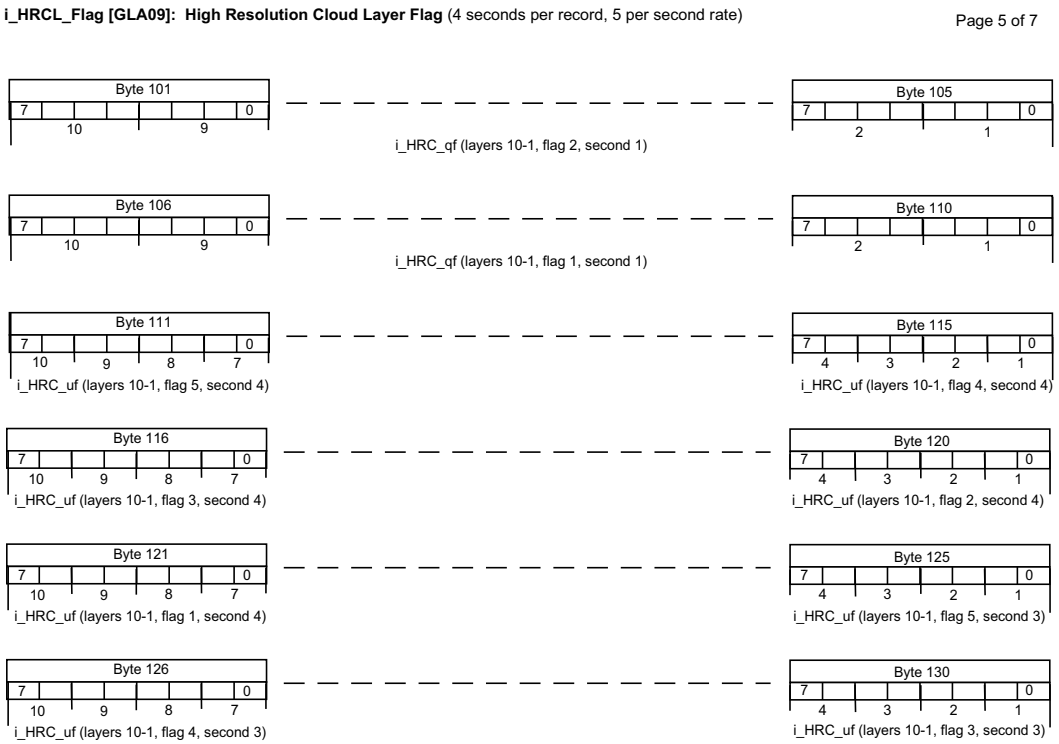


Figure 5-53 High Resolution Cloud Layer Flag (Continued)

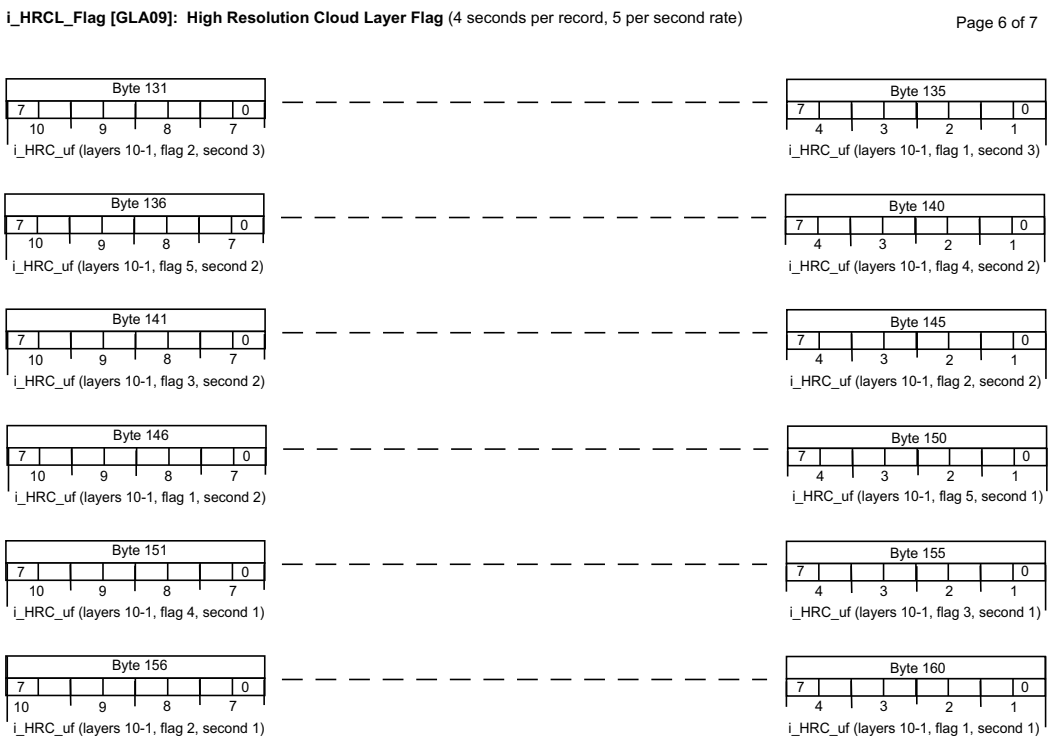


Figure 5-53 High Resolution Cloud Layer Flag (Continued)

i_HRCL_Flag [GLA09]: High Resolution Cloud Layer Flag (4 seconds per record, 5 per second rate)

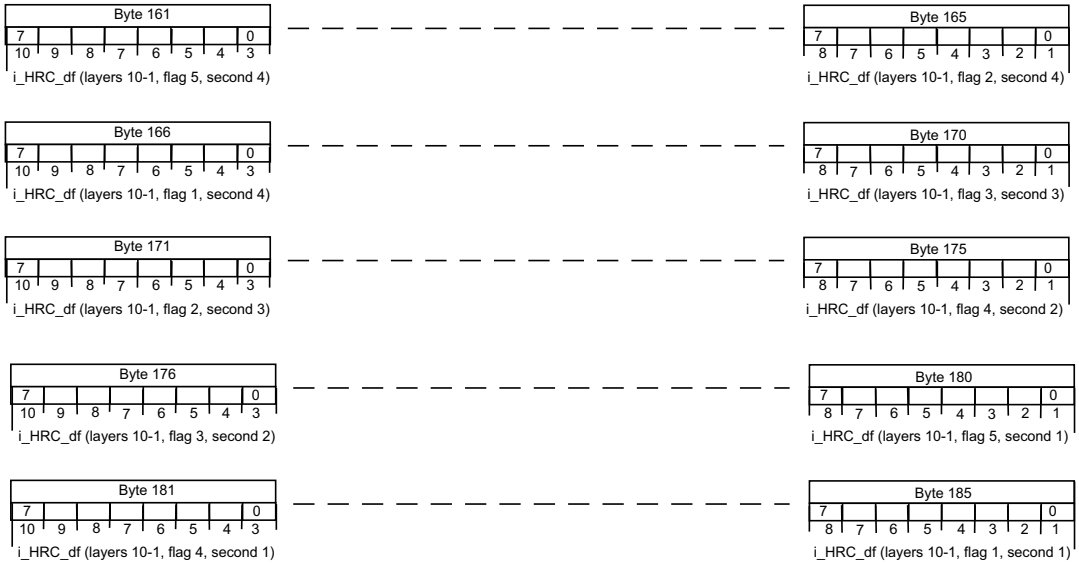


Figure 5-53 High Resolution Cloud Layer Flag (Continued)

i_LRCL_Flag [GLA09]: Low Resolution Cloud Layer Flag (4 seconds per record, at once per 4 second rate)

af = availability flag: Tells how many cloud layers were found at this resolution from the 532 nm channel.
value 15 = cloud layers were not searched for; value 0 = cloud layers were searched for, but not detected

qf=quality flag: value 15 = cloud layers were not searched for - either bad data or cloud layers were not found at a coaser resolution;
value 1 = low chance of being a cloud; value 2 = moderate; value 3 = high; value 4 = no doubt -- based upon noise-to-signal and geometric thickness evaluation; Value 14 = height of bottom of lowest detected layer in profile very uncertain because ground signal was not detected.

df = diurnal flag: This tells whether a given layer would be detected during normal daylight conditions. value 0 = layer would not have been detected in typical daytime background; value 1 = layer would have been detected in daylight

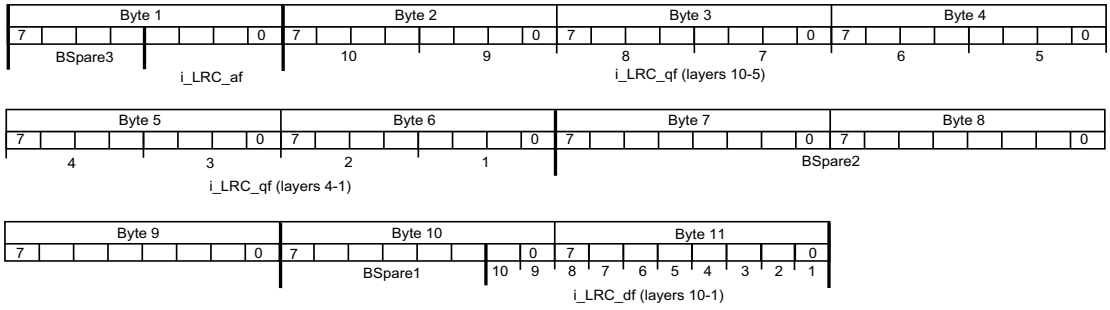


Figure 5-54 Low Resolution Cloud Layer Flag

i_LRir_QAflag [GLA09]: Low Resolution 1064 Quality Flag (once per 4 seconds rate)

af = availability flag: It provides the number of cloud layers determined from the 1064 nm data.
value 0 = layers searched for but not detected; value 15 = cloud layers not searched for.

QAflag = quality flag: value 15 = cloud layers were not searched for; value 0 = cloud layers were searched for but not detected; values 1-14 indicate increasing confidence of good cloud retrieval (value 1 = least confidence, value 14 = greatest confidence).

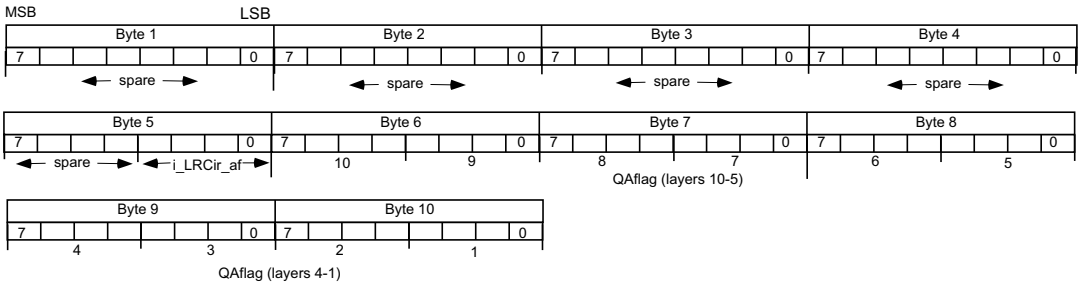


Figure 5-55 Low Resolution 1064 Quality Flag

i_MRCL_Flag [GLA09]: Medium Resolution Cloud Layer Flag (4 seconds per record, at once per second rate)

af = availability flag: Tells how many cloud layers were found at this resolution from the 532 nm channel.
value 15 = cloud layers were not searched for; value 0 = cloud layers were searched for, but not detected

qf=quality flag: value 15 = cloud layers were not searched for - either bad data or cloud layers were not found at a coaser resolution; value 1 = low chance of being a cloud; value 2 = moderate; value 3 = high; value 4 = no doubt -- based upon noise-to-signal and geometric thickness evaluation; Value 14 = height of bottom of lowest detected layer in profile very uncertain because ground signal was not detected.

df = diurnal flag: This tells whether a given layer would be detected during normal daylight conditions. value 0 = layer would not have been detected in typical daytime background; value 1 = layer would have been detected in daylight

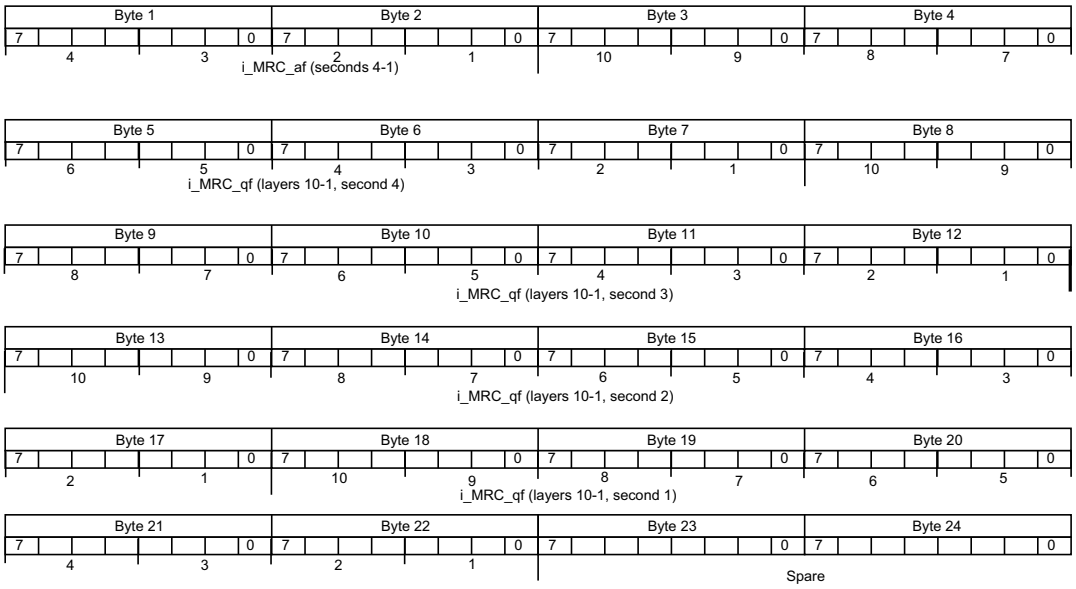


Figure 5-56 Medium Resolution Cloud Layer Flag

i_MRCL_Flag [GLA09]: Medium Resolution Cloud Layer Flag (4 seconds per record, at once per second rate) Page 2 of 2

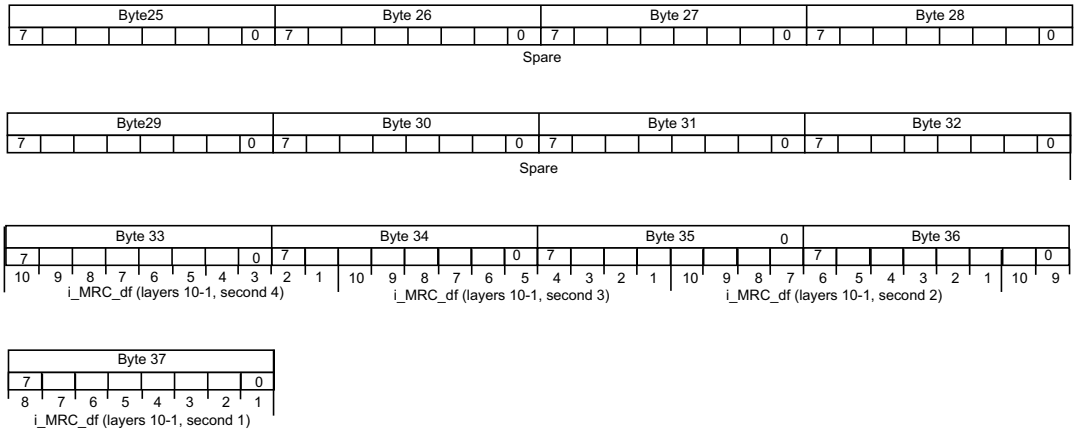


Figure 5-56 Medium Resolution Cloud Layer Flag (Continued)

i_MRir_QAflag [GLA09, 11]: Medium Resolution 1064 Quality Flag (4 seconds per record, at once per second rate)

af = availability flag: It provides the number of cloud layers determined from the 1064 nm data.
value 0 = layers searched for but not detected; value 15 = cloud layers not searched for.

QAflag = quality flag: value 15 = cloud layers were not searched for; value 0 = cloud layers were searched for but not detected; values 1-14 indicate increasing confidence of good cloud retrieval (value 1 = least confidence, value 14 = greatest confidence).

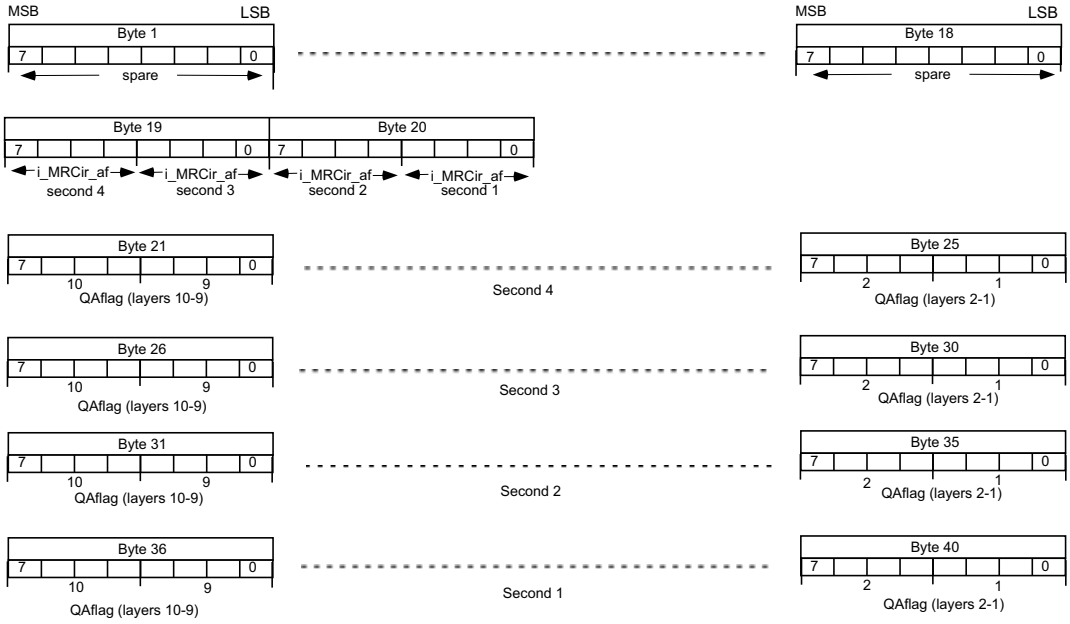


Figure 5-57 Medium Resolution 1064 Quality Flag

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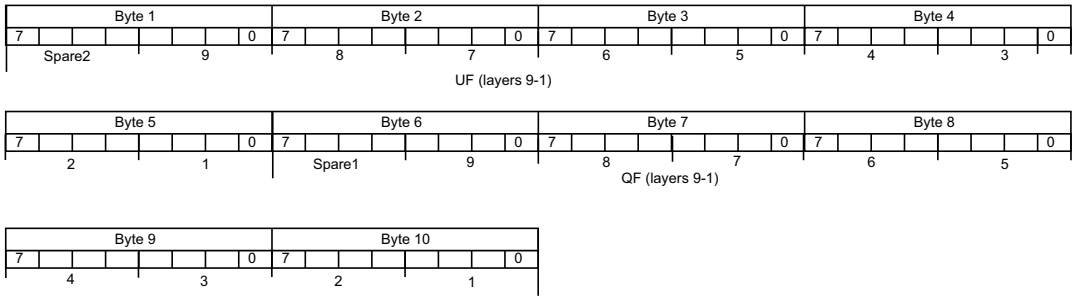
i_aer4_bs_flag [GLA10]: Aerosol Backscatter Flag (once per 4 sec., up to 9 layers/record)

(QF = Quality Flag; UF = Use Flag)

The layers shown below are ordered as follows. Layer 9 corresponds to the lowest layer in the atmosphere (the PBL).
Layers 8-4 are the for the elevated aerosol layers below 20 km, with 8 the lowest and 4 the highest in altitude.
Layers 3 - 1 are for elevated aerosol above 20 km again with 3 the lowest and 1 the highest.
For example if there were two elevated aerosol layers and the PBL detected, then the flags would be set for layers 9 (PBL), 4 and 5.
In this case layer 4 is the highest elevated aerosol layer found.



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Layer Use Flag Values

a) For backscatter cross section, the use flag gives saturation status as follows:

Use FLAG SATURATION STATUS
0 = no saturation detected
1 = one or two bins were saturated with 1064 nm conversion performed
2 = at least three bins were saturated with 1064 nm conversion performed
3 = at least one but less than four bins were saturated with no conversion performed
4 = four or more bins were saturated with no conversion performed
15 = invalid

Quality Flag Values

0 = 0-5 % Error
1 = 5-10 % Error
2 = 10-15 % Error
3 = 15-20 % Error
4 = 20-25 % Error
5 = 25-30 % Error
6 = 30-35 % Error
7 = 35-40 % Error
8 = 40-45 % Error
9 = 45-50 % Error
10 = 50-55 % Error
11 = 55-60 % Error
12 = 60-65 % Error
13 = 65-70 % Error
14 = 70 and greater % Error
15 = Unable to calculate error

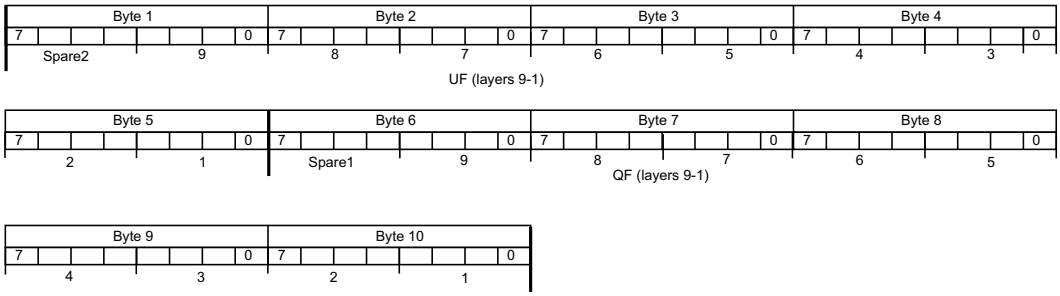
Figure 5-58 Aerosol Backscatter Flag

i_aer4_ext_flag [GLA10]: Aerosol Extinction Flag (once per 4 sec., up to 9 layers/record)

Page 1 of 2

(QF = Quality Flag; UF = Use Flag)

The layers shown below are ordered as follows. Layer 9 corresponds to the lowest layer in the atmosphere (the PBL).
Layers 8-4 are the for the elevated aerosol layers below 20 km, with 8 the lowest and 4 the highest in altitude.
Layers 3 - 1 are for elevated aerosol above 20 km again with 3 the lowest and 1 the highest.
For example if there were two elevated aerosol layers and the PBL detected, then the flags would be set for layers 9 (PBL), 4 and 5.
In this case layer 4 is the highest elevated aerosol layer found.



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Layer Use Flag Values

a) for extinction cross section and layer optical depth, the use flag designates layer type category as follows:

Aerosol: {based on S ratio default index, PSC flag, and tropopause height}
Use Flag Meaning
00 = PBL generic (all PBL indices not mentioned below)
01 = PBL maritime (index 4)
02 = PBL continental ice (index 7)
03 = PBL continental haze (index 11)
04 = PBL Saharan dust (index 12)
05 = PBL desert (index 13)
06 = PBL smoke (indices 15,3)
07 = TROP generic (all TROP indices not mentioned below)
08 = TROP volcanic (index 3)
09 = TROP continental haze (index 11)
10 = TROP Saharan dust (index 12)
11 = TROP smoke (index 15)
12 = STRATO aerosol (any non-PSC layer whose top is > tropopause
13 = PSC type I (PSC with rh less than or equal to 95%)
14 = PSC type II (PSC with rh greater than 95%)
15 = invalid

Quality Flag Values

0 = 0-5 % Error
1 = 5-10 % Error
2 = 10-15 % Error
3 = 15-20 % Error
4 = 20-25 % Error
5 = 25-30 % Error
6 = 30-35 % Error
7 = 35-40 % Error
8 = 40-45 % Error
9 = 45-50 % Error
10 = 50-55 % Error
11 = 55-60 % Error
12 = 60-65 % Error
13 = 65-70 % Error
14 = 70 and greater % Error
15 = Unable to calculate error

Figure 5-59 Aerosol Extinction Flag

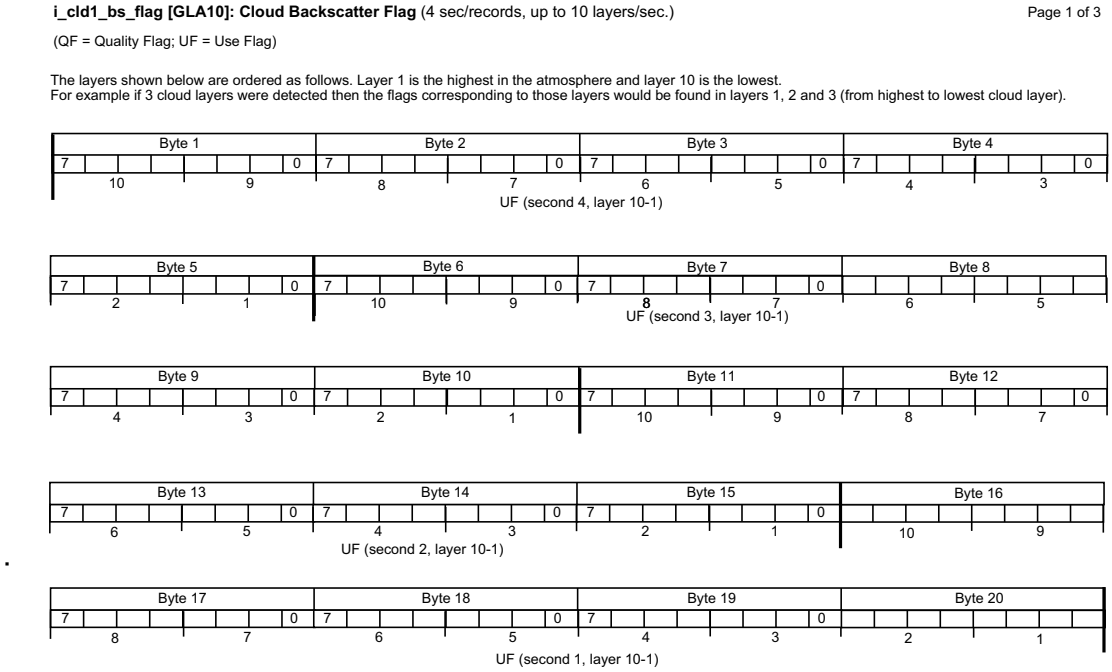
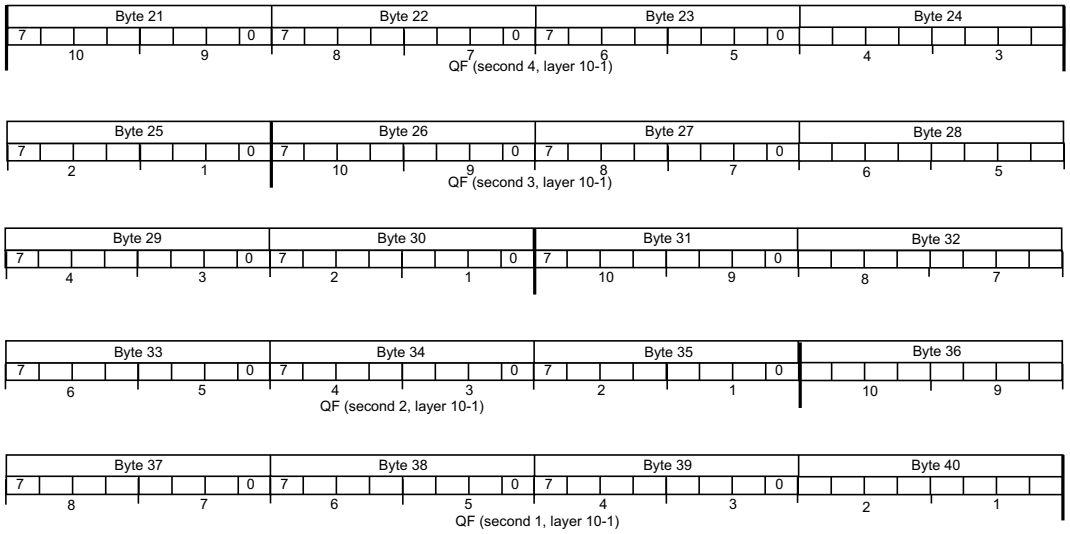


Figure 5-60 Cloud Backscatter Flag

i_cld1_bs_flag [GLA10]: Cloud Backscatter Flag (4 sec/records, up to 10 layers/sec.) Page 2 of 3

(QF = Quality Flag; UF = Use Flag)



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Layer Use Flag Values

a) For backscatter cross section, the use flag gives saturation status as follows:

Use FLAG SATURATION STATUS
- 0 = no saturation detected
- 1 = one or two bins were saturated with 1064 nm conversion performed
- 2 = at least three bins were saturated with 1064 nm conversion performed
- 3 = at least one but less than four bins were saturated with no conversion performed
- 4 = four or more bins were saturated with no conversion performed
- 15 = invalid

Quality Flag Values

- 0 = 0-5 % Error
- 1 = 5-10 % Error
- 2 = 10-15 % Error
- 3 = 15-20 % Error
- 4 = 20-25 % Error
- 5 = 25-30 % Error
- 6 = 30-35 % Error
- 7 = 35-40 % Error
- 8 = 40-45 % Error
- 9 = 45-50 % Error
- 10 = 50-55 % Error
- 11 = 55-60 % Error
- 12 = 60-65 % Error
- 13 = 65-70 % Error
- 14 = 70 and greater % Error
- 15 = Unable to calculate error

Figure 5-60 Cloud Backscatter Flag (Continued)

i_cld1_ext_flag [GLA10]: Cloud Extinction Flag (4 sec/records, up to 10 layers/sec.) Page 1 of 3

(QF = Quality Flag; UF = Use Flag)

The layers shown below are ordered as follows. Layer 1 is the highest in the atmosphere and layer 10 is the lowest.
For example if 3 cloud layers were detected then the flags corresponding to those layers would be found in layers 1, 2 and 3 (from highest to lowest cloud layer).

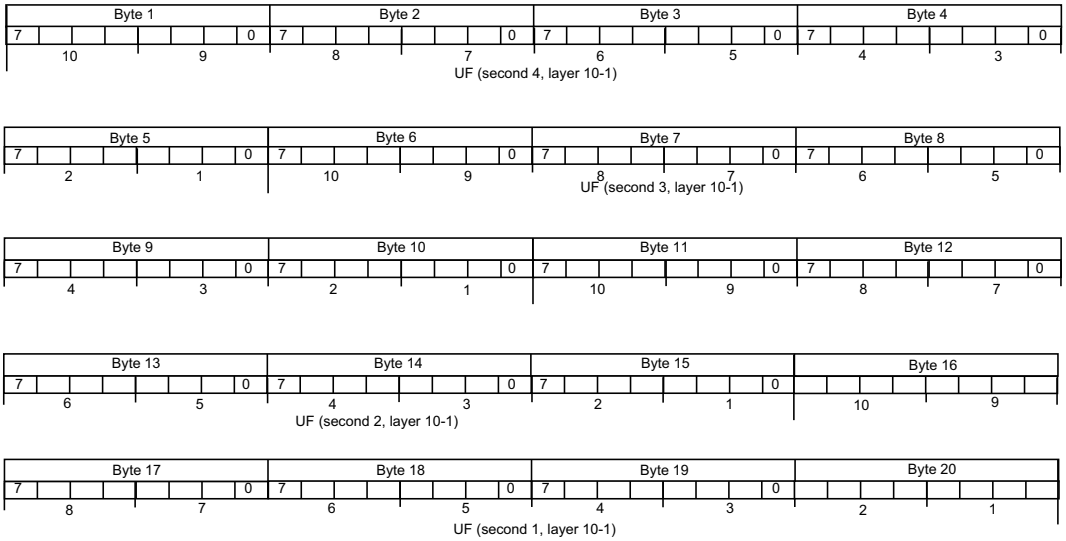
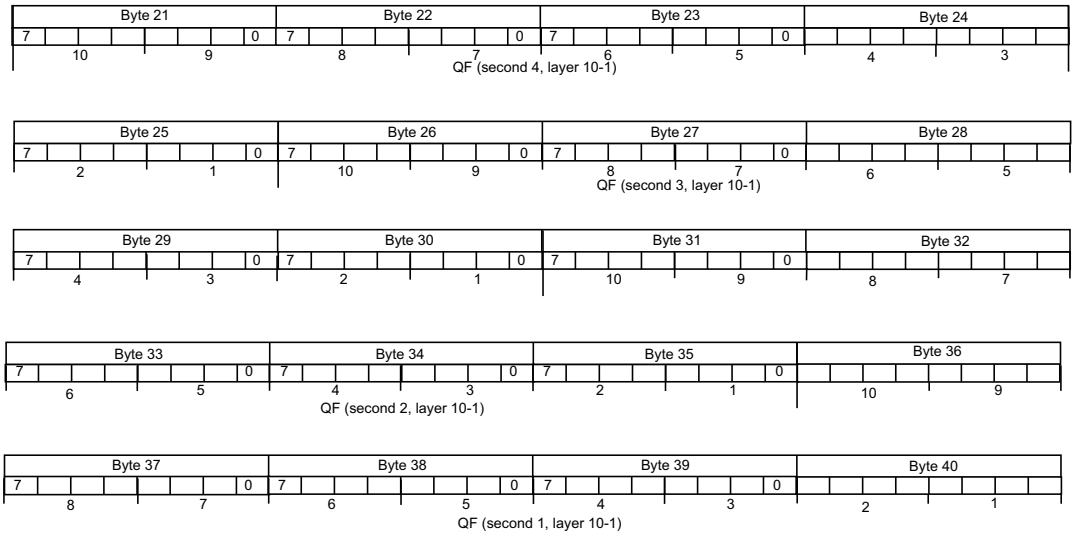


Figure 5-61 Cloud Extinction Flag

i_cld1_ext_flag [GLA10]: Cloud Extinction Flag (4 sec/records, up to 10 layers/sec.) Page 2 of 3

(QF = Quality Flag; UF = Use Flag)



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Layer Use Flag Values

a) for extinction cross section and layer optical depth, the use flag designates layer type category as follows:

Cloud: {based on average cloud temperature, water cloud is warmer than –13 C}

Use Flag Meaning
00 = less than or equal to –75.0 C
01 = -75.0 through –68.5
02 = -68.5 through –62.0
03 = -62.0 through –55.5
04 = -55.5 through –49.0
05 = -49.0 through –32.5
06 = -32.5 through –26.0
07 = -26.0 through –19.5
08 = -19.5 through –13.0
09 = -13.0 through –6.5
10 = -6.5 through 0.0
11 = 0.0 through 6.5
12 = 6.5 through 13.0
13 = 13.0 through 19.5
14 = greater than 19.5 C
15 = invalid

Quality Flag Values

0 = 0-5 % Error
1 = 5-10 % Error
2 = 10-15 % Error
3 = 15-20 % Error
4 = 20-25 % Error
5 = 25-30 % Error
6 = 30-35 % Error
7 = 35-40 % Error
8 = 40-45 % Error
9 = 45-50 % Error
10 = 50-55 % Error
11 = 55-60 % Error
12 = 60-65 % Error
13 = 65-70 % Error
14 = 70 and greater % Error
15 = Unable to calculate error

Figure 5-61 Cloud Extinction Flag (Continued)

i_aer4_sval_uf [GLA10]: Aerosol True S Values Use Flag (once per 4 sec., up to 9 layers/record)

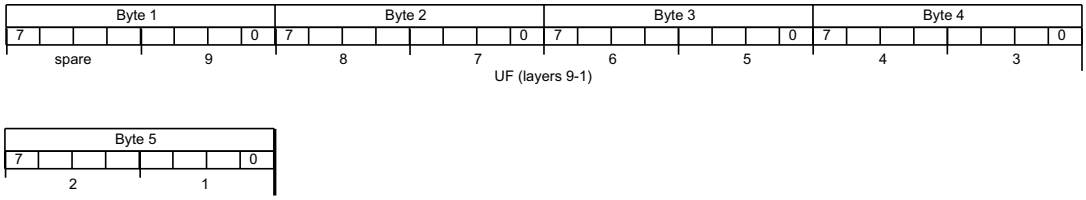


Figure 5-62 Aerosol True S Values Use Flag

i_cld1_sval_uf [GLA10]: Cloud True S Values Use Flag (4 sec/records, up to 10 layers/sec.)

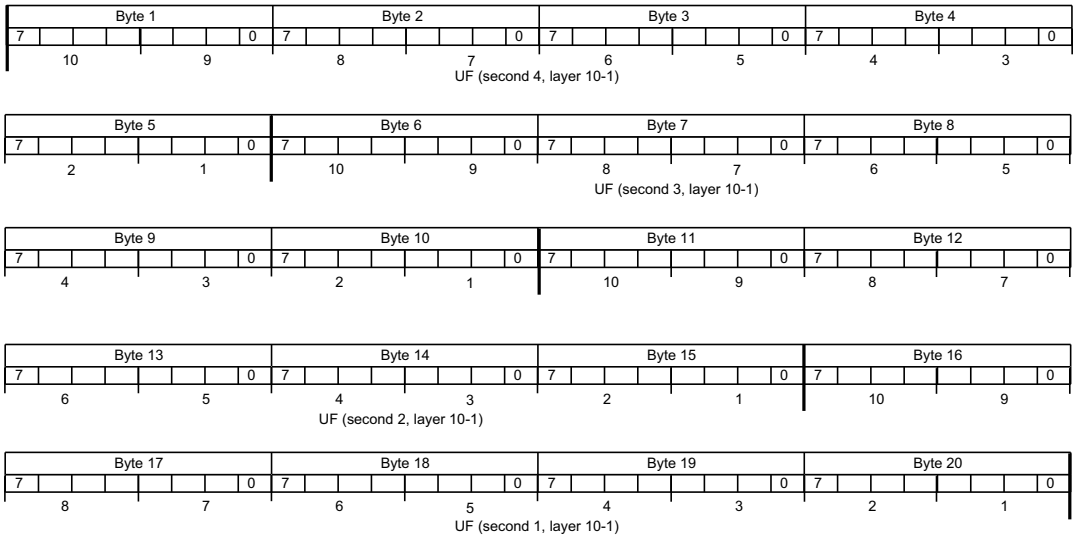


Figure 5-63 Cloud True S Values Use Flag

i_aer4_flag [GLA11]: Aerosol Optical Depth (4 sec. per record, at once per 4 second rate)

(QF = Quality Flag; UF = Use Flag)

The layers shown below are ordered as follows. Layers 8-4 are the for the elevated aerosol layers below 20 km, with 8 the lowest and 4 the highest in altitude. Layers 3 - 1 are for elevated aerosol above 20 km again with 3 the lowest and 1 the highest. For example if there were two elevated aerosol layers detected which were below 20 km, then the flags would be set for layers 8 and 7. In this case layer 7 is the highest elevated aerosol layer found. The values for layers 1-3 would be invalid.

Byte 1								Byte 2								Byte 3								Byte 4							
7							0	7							0	7							0	7							0
UF (layer 8)				UF (layer 7)				UF (layer 6)				UF (layer 5)				UF (layer 4)				UF (layer 3)				UF (layer 2)				UF (layer 1)			

Byte 5								Byte 6								Byte 7								Byte 8							
7							0	7							0	7							0	7							0
QF (layer 8)				QF (layer 7)				QF (layer 6)				QF (layer 5)				QF (layer 4)				QF (layer 3)				QF (layer 2)				QF (layer 1)			

Layer Use Flag Values

Use Flag Meaning for tropospheric layers (layers 4-8)

0 - none (use your default Sa)
1 - sulfate+carbon (67.5 sr)
2 - carbon (62.0 sr)
3 - salt+dust (32.5 sr)
4 - salt (28.5 sr)
5 - sulfate (60.0 sr)
6 - dust+carbon (58.1 sr)
7 - salt+dust+sulfate (47.2 sr)
8 - salt+carbon (49.1 sr)
9 - salt+sulfate (47.9 sr)
10 - dust (42.5 sr)
11 - salt+dust+carbon (48.2 sr)
12 - dust+sulfate (56.5 sr)
13 - salt+carbon+sulfate (53.3 sr)
14 - dust+carbon+sulfate (58.9 sr)
15 - all (52.3 sr)

Use flag meaning for stratospheric layers (layers 1-3)

12 - Stratospheric aerosol (non PSC layer whose top is > tropopause)
13 - PSC Tyoe I
14 - PSC Type II
15 - Invalid

Quality Flag Values

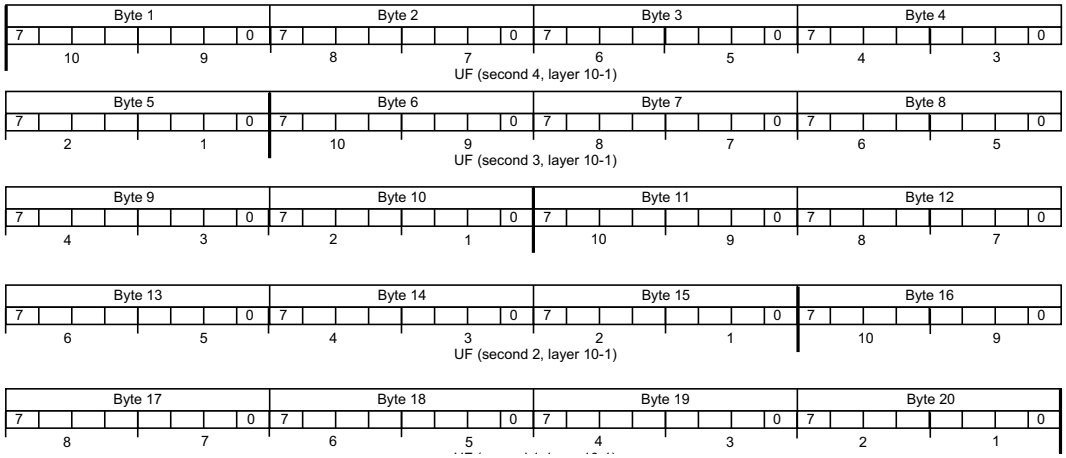
0 = 0-5 % Error
1 = 5-10 % Error
2 = 10-15 % Error
3 = 15-20 % Error
4 = 20-25 % Error
5 = 25-30 % Error
6 = 30-35 % Error
7 = 35-40 % Error
8 = 40-45 % Error
9 = 45-50 % Error
10 = 50-55 % Error
11 = 55-60 % Error
12 = 60-65 % Error
13 = 65-70 % Error
14 = 70 and greater % Error
15 = Unable to calculate error

Figure 5-64 Aerosol Optical Depth

i_cld1_flag [GLA11]: Cloud Optical Depth (4 sec. per record, at once per second rate) Page 1 of 3

(QF = Quality Flag; UF = Use Flag; see Page 3 for Value Descriptions)

The layers shown below are ordered as follows. Layer 1 is the highest in the atmosphere and layer 10 is the lowest.
For example if 3 cloud layers were detected then the flags corresponding to those layers would be found in layers 1, 2 and 3 (from highest to lowest cloud layer).



i_cld1_flag [GLA11]: Cloud Optical Depth (4 sec. per record, at once per second rate) Page 2 of 3

(QF = Quality Flag; UF = Use Flag; see Page 3 for Value Descriptions)

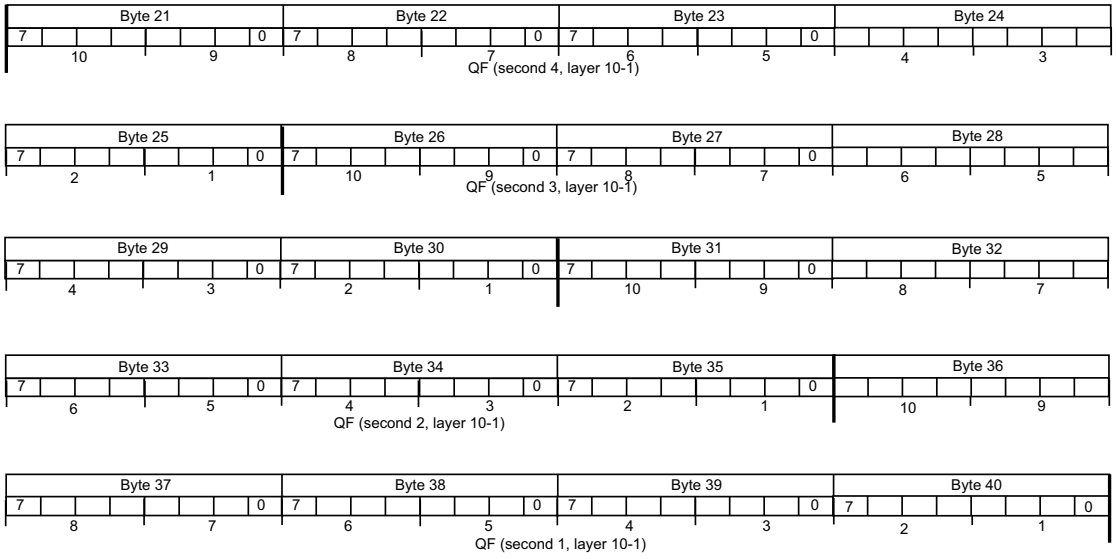


Figure 5-65 Cloud Optical Depth

i_cld1_flag [GLA11]: Cloud Optical Depth (4 sec. per record, at once per second rate) Page 3 of 3

(QF = Quality Flag; UF = Use Flag)

Layer Use Flag Values

a) for extinction cross section and layer optical depth, the use flag designates layer type category as follows:

Cloud: {based on average cloud temperature, water cloud is warmer than –13 C}

Use Flag Meaning
00 = less than or equal to –75.0 C
01 = -75.0 through –68.5
02 = -68.5 through –62.0
03 = -62.0 through –55.5
04 = -55.5 through –49.0
05 = -49.0 through –32.5
06 = -32.5 through –26.0
07 = -26.0 through –19.5
08 = -19.5 through –13.0
09 = -13.0 through –6.5
10 = -6.5 through 0.0
11 = 0.0 through 6.5
12 = 6.5 through 13.0
13 = 13.0 through 19.5
14 = greater than 19.5 C
15 = invalid

Quality Flag Values

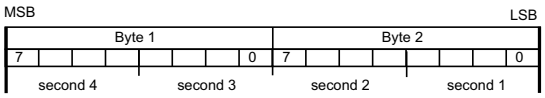
0 = 0-5 % Error
1 = 5-10 % Error
2 = 10-15 % Error
3 = 15-20 % Error
4 = 20-25 % Error
5 = 25-30 % Error
6 = 30-35 % Error
7 = 35-40 % Error
8 = 40-45 % Error
9 = 45-50 % Error
10 = 50-55 % Error
11 = 55-60 % Error
12 = 60-65 % Error
13 = 65-70 % Error
14 = 70 and greater % Error
15 = Unable to calculate error

Figure 5-65 Cloud Optical Depth (Continued)

i_cld1_mswf [GLA11]: Multiple Scattering Warning Flag (4 sec. per record, at once per second rate)

4 bit set of values;

0 = < 0.010
1 = 0.010 - 0.030
2 = 0.030 - 0.060
3 = 0.060 - 0.100
4 = 0.100 - 0.150
5 = 0.150 - 0.225
6 = 0.225 - 0.300
7 = 0.300 - 0.400
8 = 0.400 - 0.500
9 = 0.500 - 0.670
10 = 0.670 - 0.900
11 = 0.900 - 1.200
12 = 1.200 - 1.600
13 = 1.600 - 2.000
14 = > 2.000
15 = Invalid



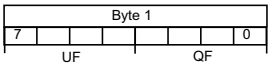
Note: A warning flag value of 15 will be the default whenever no 532nm signal is available (as when the 532 laser energy is < 4 mJ during daytime). To distinguish this case from that of optically thick clouds, one must check the number of layers. If there were zero layers reported, but the MSWF is 15, then the cause is the lack of useable 532 data. If the number of layers is > 0 and the MSWF is 15, then the cause is total extinction of the lidar beam (this happens for clouds of optical depth > about 3).

A warning flag of '0' is a very good indicator of no layers or a layer so thin it won't cause any altimetry range delays.

Figure 5-66 Multiple Scattering Warning Flag

i_pbl4_flag [GLA11]: PBL Optical Depth (4 sec. per record, at once per 4 second rate)

(QF = Quality Flag; UF = Use Flag)



Layer Use Flag Values

Use Flag Meaning for PBL

0 - none (use your default Sa)
1 - sulfate+carbon (67.5 sr)
2 - carbon (62.0 sr)
3 - salt+dust (32.5 sr)
4 - salt (28.5 sr)
5 - sulfate (60.0 sr)
6 - dust+carbon (58.1 sr)
7 - salt+dust+sulfate (47.2 sr)
8 - salt+carbon (49.1 sr)
9 - salt+sulfate (47.9 sr)
10 - dust (42.5 sr)
11 - salt+dust+carbon (48.2 sr)
12 - dust+sulfate (56.5 sr)
13 - salt+carbon+sulfate (53.3 sr)
14 - dust+carbon+sulfate (58.9 sr)
15 - all (52.3 sr)

Quality Flag Values

0 = 0-5 % Error
1 = 5-10 % Error
2 = 10-15 % Error
3 = 15-20 % Error
4 = 20-25 % Error
5 = 25-30 % Error
6 = 30-35 % Error
7 = 35-40 % Error
8 = 40-45 % Error
9 = 45-50 % Error
10 = 50-55 % Error
11 = 55-60 % Error
12 = 60-65 % Error
13 = 65-70 % Error
14 = 70 and greater % Error
15 = Unable to process

Figure 5-67 PBL Optical Depth

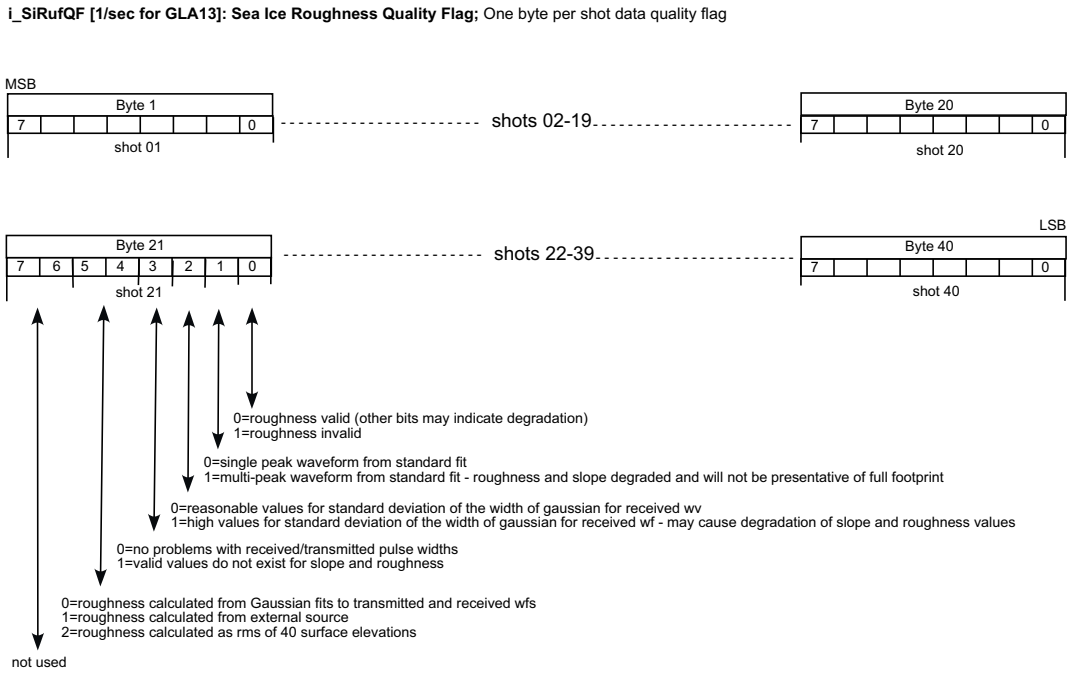


Figure 5-68 Sea Ice Roughness Quality Flag

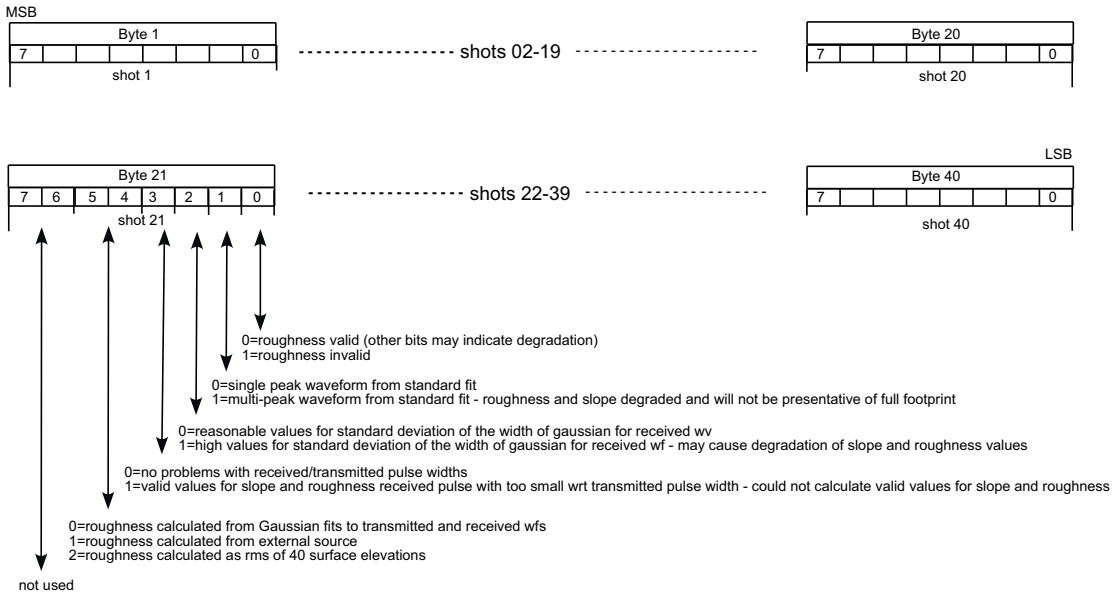


Figure 5-69 Ocean RMS Roughness Quality Flag

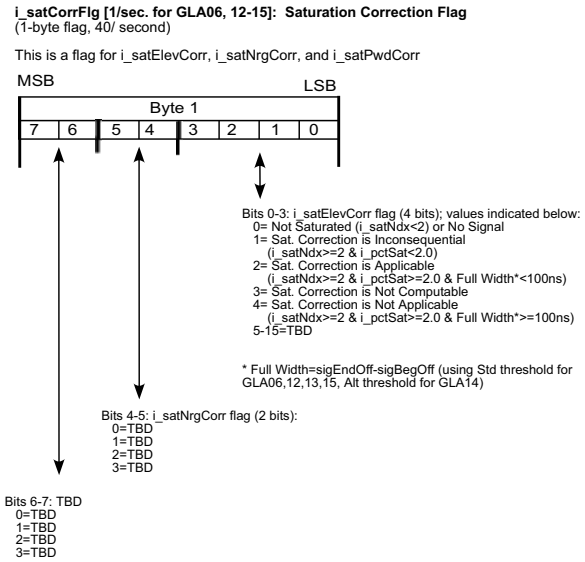


Figure 5-70 Saturation Correction Flag

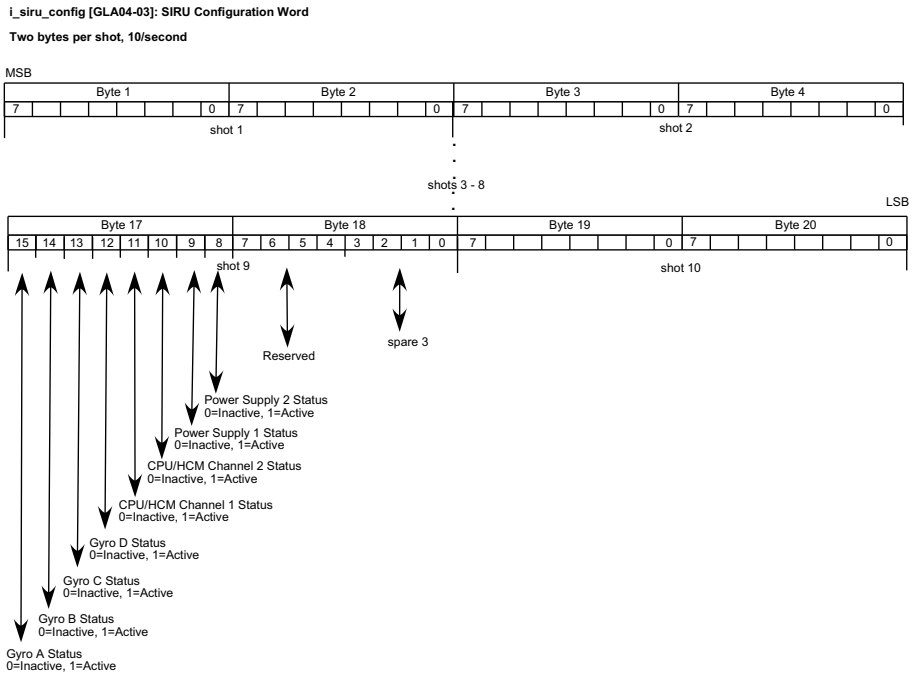


Figure 5-71 SIRU Configuration Word

Abbreviations & Acronyms

A2P	Algorithm-to-Product Conversion
ALT	Altimeter or Altimetry, also designation for the EOS-Altimeter spacecraft series
ANCxx	GLAS Ancillary Data Files
APID	GLAS Level-0 Data file
ATBD	Algorithm Theoretical Basis Document
ATM	Atmosphere
CCB	Change Control Board
ClearCase	GSAS version tracking software
CR	Change Request
DAAC	Distributed Active Archive Center
DEM	Digital Elevation Model
DFD	Data Flow Diagram
DLT	Digital Linear Tape
EDOS	EOS Data and Operations System
EDS	Expedited Data Set
ELEV	Elevation
EOC	EOS Operating Center
EOS	NASA Earth Observing System Mission Program
EOSDIS	Earth Observing System Data and Information System
GB	Gigabyte
GDS	GLAS Ground Data System
GLAS	Geoscience Laser Altimeter System instrument or investigation
GLAxx	GLAS Science Data Product Files
GLOP	GLAS Level-0 PGE (correctly called GLAS_L0proc)
TBD	to be determined, to be done, or to be developed

Glossary

aggregate	A collection, assemblage, or grouping of distinct data parts together to make a whole. It is generally used to indicate the grouping of GLAS data items, arrays, elements, and EOS parameters into a data record. For example, the collection of Level 1B EOS Data Parameters gathered to form a one-second Level 1B data record. It could be used to represent groupings of various GLAS data entities such as data items aggregated as an array, data items and arrays aggregated into a GLAS Data Element, GLAS Data Elements aggregated as an EOS Data Parameter, or EOS Data Parameters aggregated into a Data Product record.
array	An ordered arrangement of homogenous data items that may either be synchronous or asynchronous. An array of data items usually implies the ability to access individual data items or members of the array by an index. An array of GLAS data items might represent the three coordinates of a georeference location, a collection of values at a rate, or a collection of values describing an altimeter waveform.
file	A collection of data stored as records and terminated by a physical or logical end-of-file (EOF) marker. The term usually applies to the collection within a storage device or storage media such as a disk file or a tape file.
header	A text and/or binary label or information record, record set, or block, prefacing a data record, record set, or a file. A header usually contains identifying or descriptive information, and may sometimes be embedded within a record rather than attached as a prefix.
item	Specifically, a data item. A discrete, non-decomposable unit of data, usually a single word or value in a data record, or a single value from a data array. The representation of a single GLAS data value within a data array or a GLAS Data Element.
label	The text and/or binary information records, record set, block, header, or headers prefacing a data file or linked to a data file sufficient to form a labeled data product. A label may consist of a single header as well as multiple headers and markers depending on the defining authority.
Level 0	The level designation applied to an EOS data product that consists of raw instrument data, recorded at the original resolution, in time order, with any duplicate or redundant data packets removed.
Level 1A	The level designation applied to an EOS data product that consists of reconstructed, unprocessed Level 0 instrument data, recorded at the full resolution with time referenced data records, in time order. The data are annotated with ancillary information including radiometric and geometric calibration coefficients, and georeferencing parameter data (i.e., ephemeris data). The included, computed coefficients and parameter data have not however been applied to correct the Level 0 instrument data contents.
Level 1B	The level designation applied to an EOS data product that consists of Level 1A data that have been radiometrically corrected, processed from raw data into sensor data units, and have been geolocated according to applied georeferencing data.

Level 2	The level designation applied to an EOS data product that consists of derived geophysical data values, recorded at the same resolution, time order, and geo-reference location as the Level 1A or Level 1B data.
Level 3	The level designation applied to an EOS data product that consists of geophysical data values derived from Level 1 or Level 2 data, recorded at a temporally or spatially resampled resolution.
Level 4	The level designation applied to an EOS data product that consists of data from modeled output or resultant analysis of lower level data that are not directly derived by the GLAS instrument and supplemental sensors.
metadata	The textual information supplied as supplemental, descriptive information to a data product. It may consist of fixed or variable length records of ASCII data describing files, records, parameters, elements, items, formats, etc., that may serve as catalog, data base, keyword/value, header, or label data. This data may be parsable and searchable by some tool or utility program.
orbit revolution	The passage of time and spacecraft travel signifying a complete journey around a celestial or terrestrial body. For GLAS and the EOS ICESat spacecraft each orbit revolution count starts at the time when the spacecraft is on the equator traveling toward the North Pole, continues through the equator crossing as the spacecraft ground track moves toward the South Pole, and terminates when the spacecraft has reached the equator moving northward from the South Polar region.
parameter	Specifically, an EOS Data Parameter. This is a defining, controlling, or constraining data unit associated with a EOS science community approved algorithm. It is identified by an EOS Parameter Number and Parameter Name. An EOS Data Parameter within the GLAS Data Product is composed of one or more GLAS Data Elements.
pass	A sub-segment of an orbit, it may consist of the ascending or descending portion of an orbit (e.g., a descending pass would consist of the ground track segment beginning with the northernmost point of travel through the following southernmost point of travel), or the segment above or below the equator (e.g., either the northern or southern hemisphere portion of the ground track on any orbit).
product	Specifically, the Data Product or the EOS Data Product. This is implicitly the labeled data product or the data product as produced by software on the DAAC or SCF. A GLAS data product refers to the data file or record collection either prefaced with a product label or standard formatted data label or linked to a product label or standard formatted data label file. Loosely used, it may indicate the entire set of product files contained in a data repository.
record	A specific organization or aggregate of data items. It represents the collection of EOS Data Parameters within a given time interval, such as a one-second data record. It is the first level decomposition of a product file.
Standard Data Product	Specifically, a GLAS Standard Data Product. It represents an EOS ICESat/ GLAS Data Product produced on the DAAC or on the SCF. It is routinely produced and is intended to be archived in the EOSDIS data repository for EOS user community-wide access and retrieval.
variable	Usually a reference in a computer program to a storage location.